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THESIS

ANALYSIS OF THE
DOD 5000.2R
PROJECT MANAGEMENT PROCESS

by

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December 1998

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13. ABSTRACT *(maximum 200 words)*

Acquisition of weapon systems for the Department of Defense is governed by the regulation DoD 5000.2R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs." During acquisition reform, this document was created as a simplified regulation to allow regulatory relief to acquisition project managers. It replaced two lengthy volumes providing requirements and guidance on acquisition procedures. The thesis analyzes the new regulation from a project process perspective. First, a requirements analysis is performed to identify project management requirements. Second, a functional analysis allocates these requirements to a timeline, creating a "Functional Architecture." The Functional Architecture provides the basis for evaluation of the DoD 5000.2R project management process. Finally, an evaluation is conducted from comparison with established communications models and management studies. Results of these analyses reveal over 3000 tasks are required of acquisition programs. This large number of requirements indicates extreme oversight of acquisition programs continues within acquisition reform. Recommendations are made for reevaluation of DoD policy on acquisition management and rewrite of DoD 5000.2R.

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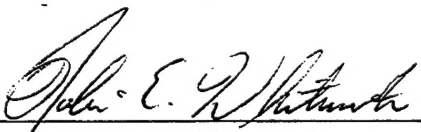
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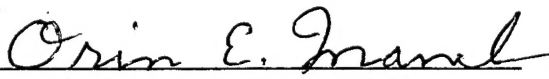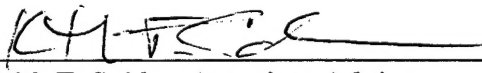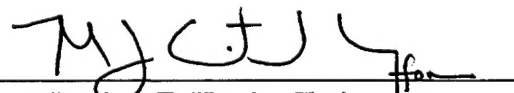
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ABSTRACT

Acquisition of weapon systems for the Department of Defense is governed by the regulation DoD 5000.2R, "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs." During acquisition reform, this document was created as a simplified regulation to allow regulatory relief to acquisition project managers. It replaced two lengthy volumes providing requirements and guidance on acquisition procedures. The thesis analyzes the new regulation from a project process perspective. First, a requirements analysis is performed to identify project management requirements. Second, a functional analysis allocates these requirements to a timeline, creating a "Functional Architecture." The Functional Architecture provides the basis for evaluation of the DoD 5000.2R project management process. Finally, an evaluation is conducted from comparison with established communications models and management studies. Results of these analyses reveal over 3000 tasks are required of acquisition programs. This large number of requirements indicates extreme oversight of acquisition programs continues within acquisition reform. Recommendations are made for reevaluation of DoD policy on acquisition management and rewrite of DoD 5000.2R.

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I. INTRODUCTION

A. PURPOSE

This thesis analyzes the regulation Department of Defense (DoD) Regulation 5000.2R "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs." This analysis leads to evaluation of this critical document's effectiveness in regulating acquisition programs and executing DoD acquisition policy.

B. BACKGROUND

The United States Department of Defense (DoD) currently uses Project and Product Managers who are ill-prepared for the management of complex technical projects -- an unfortunate but correctable situation.

The United States enjoys unparalleled military capability, primarily due to the intense screening and training performed for military personnel of all Services. Confidence in the military by US officials is well earned . . on the battlefield. However, specialty training for combat does not translate to leadership in acquisition. This has been proven when project and product managers are selected from combat units to manage technical system development and acquisition.

Due to the complex, developmental and especially technical nature of DoD acquisitions, systems engineering is required for successful management (Gunther, 1995).

While systems engineering processes are documented in industry standards, expertise is required to adapt these processes to defense acquisition programs.

Research on practices within DoD acquisition has revealed a gap between acquisition managers' actual "know-how" and the expertise required by their jobs (Thompson and Jones 1994, 141). While DoD-wide response to the Defense Acquisition Workforce Improvement Act (DAWIA) (Chapter 87 of Title 10, United States Code) is improving the training provided to all acquisition personnel, the majority of managers are still limited in acquisition-focused education opportunities. Typically, the culmination of Project Management preparation is the Defense Systems Management College Project Managers Course. It is not viewed as adequate, given the responsibilities to be assumed by these managers (Fox and Field 1988).

In the past, DoD has attempted to provide acquisition managers detailed policy and procedural guidance. To this end, the DoD Instruction 5000.2 and DoD 5000.2M Manuals of September 1987 were provided. These documents provided a rigorous process for the development of systems, including standardization of documents used for program management. However, the process defined in these large documents did not lead to better managed systems. In fact, the amount of control placed on acquisition programs by these documents was determined to be "unwieldy and too complex," given the unique nature of each acquisition program (Kaminski, Coyle and Paige 1996). In 1996, these two documents were replaced with a half-inch thick regulation DoD 5000.2R. In an accompanying memorandum, Kaminski, Coyle and Paige phrased the intent of this

regulation, "By minimizing the volume of mandatory guidance, we can free managers to exercise sound judgement when structuring and executing defense acquisition programs."

C.   PROCEDURE

The DoD 5000.2R will be analyzed for the level of constraint imposed on the Project Manager (PM) and for implications in its use as a communications tool for policy management.

This research is conducted in two stages. The first stage involves requirements and functional analyses to quantify the number of constraints in DoD 5000.2R on project management. This is done using a systems engineering standard process from IEEE Standard 1220-1994. The results of the functional analysis is a Functional Database for DoD project management. In the second stage, the DoD 5000.2R and its Functional Database are then analyzed using a formal communication model and published management studies.

D.   RESEARCH QUESTIONS

1.   Primary Question

To what extent does the DoD 5000.2R constrain the project manager?

2.   Subsidiary Questions

a)   *DoD 5000.2R Project Management Requirements*

What are the requirements included in the 5000.2R that affect defense acquisition project management?

b) *DoD 5000.2R Project Management Process*

What common functions are required to be performed by project management?

What requirements must these functions meet?

c) *Quantitative Analysis of Findings*

What are the quantities and distribution of requirements among project management functions?

d) *Qualitative Analysis of Findings*

How effective is DoD 5000.2R as a communication tool?

What implications for DoD acquisition policy can be obtained from this analysis?

E. ORGANIZATION OF STUDY

For a diagram of study organization see Figure 1.

Chapter II provides a requirements analysis for project management processes. A methodical extraction of constraints from DoD 5000.2R is performed and its results are considered in Chapter II. The result of this analysis is a Requirements Baseline presented in Appendix A.

Chapter III analyzes the functional requirements for project management processes. This includes allocating performance requirements to required functions and identification of functional considerations such as timelines. The requirements allocated to specific life cycle functions constitute the Functional Database.

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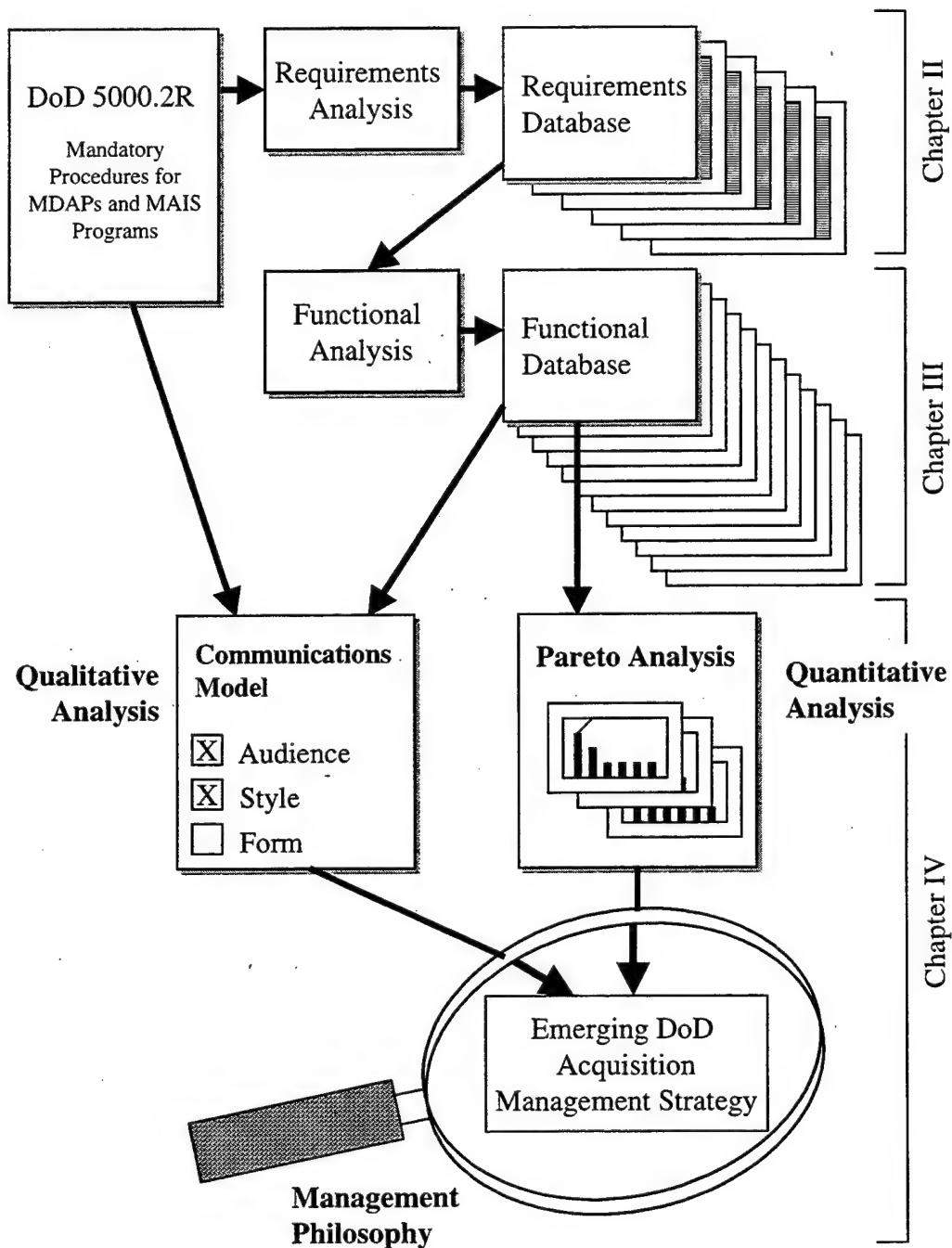
Figure 1. Study Flow (Source: Developed by Researcher)

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Chapter IV analyzes DoD 5000.2R, its Requirements Baseline and its Functional Database. They are analyzed by quantitative and qualitative methods. Implications of this regulation's effectiveness and implied DoD management philosophies are explored.

Chapter V concludes the thesis study by summarizing the findings, answering the research questions, and providing recommendations for DoD action and further research.

F.   BENEFITS OF THE STUDY

Benefits of this study are threefold. The first benefit is the identification of DoD project management tasks, requirements, and constraints as an amplification of that obtained through course work by the student. The second benefit is an understanding to the student and readers of DoD 5000.2R's true level of constraint and implications of this level. The third benefit is the requirements baseline (Appendix A) which provides background for further study of DoD project management tasks and acquisition policy.

This thesis study also provides information that extends work of both the International Council of Systems Engineers (INCOSE), in the area of defense system engineering, and Project Management Institute (PMI), in the area of DoD project management.

II.   PROJECT MANAGEMENT REQUIREMENTS

A.   INTRODUCTION

The DoD 5000.2R is used to define the process of acquisition project management. In this chapter the structure of DoD 5000.2R is discussed and the processes to extract specific requirements is described. The resulting requirements database is included in Appendix A.

B.   DOD 5000.2R

1.   Issuance

The regulation DoD 5000.2R, "Mandatory Procedures for Major Defense Acquisition Programs and Major Automated Information Systems", is authorized by the Secretary of Defense in Department of Defense Directive DoDD 5000.1. It is coordinated by the Director, Acquisition Program Integration and is released by the Under Secretary of Defense for Acquisition and Technology. Change three of DoD 5000.2R, which was released in March 1998, was used for this research.

The DoD 5000.2R was a replacement for several documents. This reduced the volume of detailed requirements. The initial DoD 5000.2R was introduced in 1996 as clarifying requirements for acquisition and empowering the program manager to independently take actions within the law and program charter.

2. Purpose

There were five stated purposes for the DoD 5000.2R:

a. to establish a simplified and flexible framework for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Programs,

b. to delineate mandatory procedures for all acquisition programs.

c. to establish a model for programs that are not considered MDAPs or MAIS.

d. to disseminate statutory requirements for all acquisition programs, and

e. to implement higher DoD directives for execution of defense acquisitions.

3. Implementation

Of particular note, DoD components are forbidden from supplementing this regulation with additional instruction (DoD 1998). This limitation makes the DoD 5000.2R the key document in determining constraints for defense acquisition project management. Upon release of the DoD 5000.2R as a replacement for a number of other acquisition regulations, it became a single point of reference for DoD acquisition programs.

4. Construction

The regulation is divided into six parts.

a)   *Part 1. Acquisition Management Process*

This section defines the general model for managing acquisition programs. This model is presented for reference and is to be tailored based on individual program circumstances.

b)   *Part 2. Program Definition*

The mandatory process required to establish operational requirements is documented in this section. This is called program definition and includes aspects of the requirements.

c)   *Part 3. Program Structure*

The program structure section identifies elements to be used in structuring the program. The elements address what the program will achieve, how the program will be developed and evaluated, and what resources will be used.

d)   *Part 4. Program Design*

This section mandates Integrated Product and Process Development and Systems Engineering as the basis for life cycle design of the program. The systems engineering portion is the largest of these and is detailed relative to other processes described in the DoD 5000.2R.

e)   ***Part 5. Program Assessments and Decision Reviews***

Milestone decisions and other assessments are delineated in this section. Additionally, the Integrated Product Team (IPT) structure above the project office is structured here.

f)   ***Part 6. Periodic Reporting***

Mandatory reports for both the project office and contractor are defined in this section.

5.   The DoD 5000.2R as Requirements Document

The DoD 5000.2R is essentially a requirements source for the process of acquisition management. The regulation was reviewed as a requirements document prior to performing the analysis.

Common problems encountered when describing requirements, such as those in this regulation, include confusion due to complex conditional clauses, inconsistent use of terminology, and omission of essential information (Sommerville and Sawyer 1997, 141). Problems such as these lead to errors and omissions, which lead to differing interpretations.

The DoD 5000.2R, while smaller than previous documents is still quite detailed. Change 3 to the document replaced a number of "will" statements into "shall" statements. This turns guidance into a requirement making the document more constraining than it was originally. Also a large portion of the requirements are nested in extremely long, complex sentences. This was the first indication that a structured requirements

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documentation approach would be required in order to extract specific constraints from the nests.

C.   METHOD OF REQUIREMENTS ANALYSIS

1.   Introduction

The method used for analysis of the DoD 5000.2R constraints was a tailored version of that found in the IEEE Standard 1220-1994 "Trial-Use Standard for Application and Management of the Systems Engineering Process." Requirements Analysis of DoD 5000.2R was conducted to determine specific requirements for the DoD
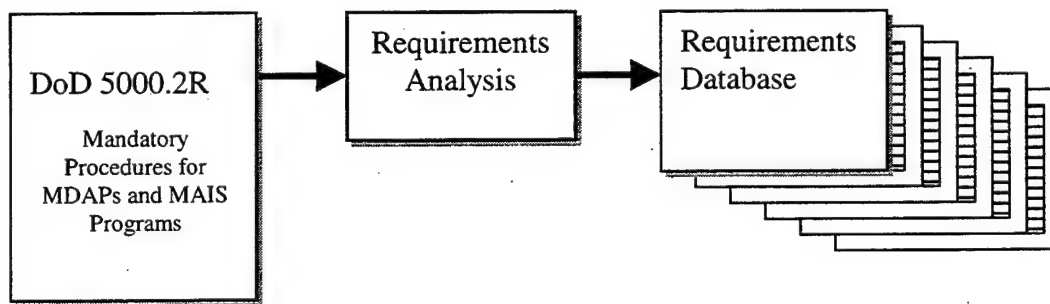
Figure 2. Requirements Analysis Context (Source: Developed by Researcher)

Acquisition process. As shown in Figure 2, a requirements analysis was used to screen this regulation and assemble a requirements database which lists specific requirements. This database is Appendix A to this thesis. Due to the fact that this is an analysis of one source document, several of the IEEE P1220 tasks were combined. Tailoring of this process is presented in Table 1 and the resulting flow in Figure 3.

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Table 1. Tailoring of Requirements Analysis (Source: Developed by Researcher)

Task No.	IEEE Task	Order Used / Not Used
6.1.1	Define Customer Expectations	(embedded in other DoD 5000.2R rqmts)
6.1.2	Define Project & Enterprise Constraints	3.
6.1.3	Define External Constraints	(embedded in other DoD 5000.2R rqmts)
6.1.4	Define Operational Scenarios	Not Used (varied and unpredictable)
6.1.5	Define Measures of Effectiveness	4.
6.1.6	Define System Boundaries	1.
6.1.7	Define Interfaces	(embedded in other DoD 5000.2R rqmts)
6.1.8	Define Utilization Environments	Not Used (varied and unpredictable)
6.1.9	Define Life Cycle Process Concepts	2.
6.1.10	Define Functional Requirements	3.
6.1.11	Define Performance Requirements	3.
6.1.12	Define Modes of Operations	5.
6.1.13	Define Technical Performance Measures	4.
6.1.14	Define Physical Characteristics	Not Applicable
6.1.15	Define Human Factors	6.
6.1.16	Establish Requirements Baseline	7.

2. Analysis Process

A structured process for documenting extracted constraints was defined following best practices for requirements capture (Sommerville and Sawyer 1997, 141). First a standard template was defined for capturing these requirements. The language used to describe the requirements was structured in simple, concise sentences. Consistency was maintained by continual indexing of terms used for all elements of the simple sentences. Additionally, all explicit and implied requirements were identified.

Step 1.		6.1.6 Define System Boundaries	
Step 2.		6.1.9 Define Life Cycle Concepts	
Step 3.	6.1.10 Define Functional Reqmts	6.1.11 Define Performance Reqmts	6.1.2 Define Constraints
Step 4.	6.1.5 Define Measures of Effectiveness	6.1.13 Define Technical Perf Measures	
Step 5.		6.1.12 Define Modes of Operations	
Step 6.		6.1.15 Define Human Factors	
Step 7.		6.1.16 Establish Reqmts	

Figure 3. Tailored Requirements Analysis Steps (Source: Developed by Researcher)

a) *Step 1. Define System Boundaries*

Requirements extracted during this analysis were for the project manager, Milestone Decision Authority, and the system's user as defined in the DoD 5000.2R.

The purpose of this analysis of the system boundaries was to define the constraints on the project manager. The DoD 5000.2R includes requirements for a number of acquisition positions such as Project Manager, Milestone Decision Authority,

and Component Acquisition Executive. For this reason system boundaries were set first and used to limit the number of requirements extracted. The primary project level interfaces defined in DoD 5000.2R are those between the project office and the Milestone Decision Authority, and between the project office and the user of equipment to be acquired. By including requirements for these primary interfaces to the project manager, a number of implied requirements were derived for the PM.

b) Step 2. Define Life Cycle Process Concepts

Part 4 of the DoD 5000.2R defines life cycle functions used as a project process. While the regulation lists nine functions, standard practice is to use eight of these combining "Test and Evaluation" with "Verification" (IEEE, 1995). Standard practice was used in this analysis. These functions are Development, Verification/ Validation (sometimes referred to as "Testing"), Production, Fielding, Training, Support, Operations, and Disposal. A more detailed development process was defined in the DoD 5000.2R in parts 1 and 6 which describe the general model and major reviews. This process is to be used as a starting point for tailoring of any acquisition program. These details along with the life cycle functions were integrated to provide a concept for the life cycle process required under the DoD 5000.2R. Table 2 shows the life cycle function and development phase combinations used to categorize the requirements. Note that development phases are only required for the development life cycle function. Other life cycle functions are not broken down further.

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Table 2. Life Cycle Functions and Phases for Requirements (Source: Developed by Researcher)

Life Cycle Function	Development Phase
Development	Pre-Milestone 0
Development	Milestone 0
Development	Phase 0 (Concept Exploration)
Development	Milestone I
Development	Phase I (Program Definition/ Risk Reduction)
Development	Milestone II
Development	Phase II (Engineering/ Manufacturing Development)
Development	Milestone III
Verification/ Validation	(not applicable)
Production	(not applicable)
Fielding	(not applicable)
Training	(not applicable)
Support	(not applicable)
Operations	(not applicable)
Disposal	(not applicable)

These life cycle functions with detailed phases for development were identified in this analysis as the life cycle process concept required by DoD 5000.2R.

c) Step 3. Define Constraints, Functional Requirements, and Performance Requirements

A review of each paragraph in the DoD 5000.2R was conducted for applicability, then individual functions required or implied were extracted to the template.

Using a plain language template of requirements, three steps of the IEEE P1220 were combined. This template consisted of a noun, verb, object, and modifiers to be extracted for each requirement. The noun identified whether the requirement was for the PM or interfacing organization. The verb indicated the function required of the organization. The object allowed categorization of subsystems and system elements influenced by the functions, while the modifiers provided constraints for the functions.

Each requirement included two items of additional information: the phase in the life cycle concept where meeting the requirement was identified, and the mechanism, if any, that was required for documentation/ execution of the requirement.

d) Step 4. Define Measures of Effectiveness and Technical Performane Measures

No measures of effectiveness or technical performance measures were identified within DoD 5000.2R.

Once the requirements list was established, none of the constraints was adequate for a generic measure of effectiveness or technical performance measure. These were left by the regulation to be project specific. While there were requirements for reporting given specific levels of cost and schedule overruns, these were inadequate for

MOE or TPM use without understanding funding, timescale, or performance impact of the overrun.

e) Step 5. Define Modes of Operation

The modes of operation are the same as life cycle phases determined in Step 2. The requirements list was reviewed for modes associated with project management. These were clearly distinguished in DoD 5000.2R Part 1 by phase of development. These modes were verified for phases from pre-Milestone 0 development through disposal by documented DoD concepts (Gunther, 1995).

f) Step 6. Define Human Factors

The DoD 5000.2R requirements were reviewed to identify any potential human factors constraints. The DoD 5000.2R does not explicitly address human factors for either physical or mental requirements of personnel involved in acquisition.

While no human factors constraints were found, the number of requirements is a potential human factors issue. Management studies indicate that as personnel become more competent at their work, less direction is required. Additionally these studies have shown that high level managers, PMs in this case, must have high technical competency in tasks that their organizations perform (Lazarus 1980). If DoD policy makers agree with these study results, the extremely large number of requirements in DoD 5000.2R imply that they consider their project managers to be incompetent at technical project management. Other studies indicate the more uncertainty in a job the less direction should be given by higher levels to allow utilizing expertise of personnel

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performing the job (Cummings and Huse 1996, 285). Acquisition programs typically contain a great deal of uncertainty in funding, schedule, and performance. The large number of requirements, and the wide variety of programs covered by this document, may imply that DoD policy makers are attempting to control them from the top using project personnel that are incompetent. This does not follow current sound management practices.

g)   *Step 7. Establish Requirements Baseline*

A requirements baseline was established in list form that included constraints obtained during the previous steps. The list was modified to a flat database form of the list and terminology was reviewed again to ensure internal consistency for sorting and reporting results.

Utilizing a database form for the list allowed a single document to support the three views required by IEEE P1220. These views are operational, functional and physical.

The operational view for this application allows determination of requirements for PM, Milestone Decision Authority or "User." It also allows requirements associated with specific reports to be identified. A functional view of DoD 5000.2R requirements provides a list of requirements for each type of function or life cycle function. While there are no physical requirements in the DoD 5000.2R to respond to a physical view, there are design constraints that influence physical solutions and

development constraints. A sorting based on life cycle function provides this view for the development function.

3. Tools

A combination of Microsoft Word and Excel was used to capture the quotations from a digital copy of DoD 5000.2R. Specific language was copied from the regulation to Excel. There it was decomposed into specific requirements meeting the defined template. Once a database form was achieved Excel was used to sort the database.

4. Categories of Requirements Database Fields

The final categories used for the requirements database are described in Table 3.

Table 3. Requirements Database Fields (Source: Developed by Researcher)

Field	Description
Requirement Number	Sequential numbering of requirements in the order of identification.
Section Number	DoD 5000.2R section number in which the requirement was found.
Section Title	DoD 5000.2R section title in which the requirement was found.
Quote	DoD 5000.2R original language containing the requirement.
Noun	Which organization was to fulfill the requirement (limited to PM, MDA, User)
Verb	The function required to be performed.
Object	The object on which the function was performed.
Using	The specific report, plan, or tool to be used in performing this requirement.
Modifier	Performance requirements if any for this function.
When	Which phase and life cycle function was associated with this requirement.

D. RESULTS OF REQUIREMENTS ANALYSIS

The requirements analysis identified 437 statements in the DoD 5000.2R that required action from either the PM, MDA, User or some combination. Based on these statements, 862 specific requirements were derived. While many statements contained only one requirement, many others were complex. For example, one very complex statement created 18 individual requirements (see requirement numbers 673 – 690 in Appendix A).

Of the 862 requirements, 770 were for accomplishment by the PM, 29 were for the MDA, 51 were for both the PM and MDA, 11 were to be accomplished by the User, and one required action from all three, PM, MDA, and User.

The results of this analysis are that there are 822 specific requirements for the PM to meet during the acquisition. In the following section these requirements will be allocated to the life cycle concept to understand the effects of iterative requirements on this total number.

E. CHAPTER SUMMARY

Results (Appendix A) show a very large number, 822, of specific requirements for the PM to meet during the acquisition. The following sections will determine effects of iterative development on this number.

III.   PROJECT MANAGEMENT FUNCTIONS

A.   INTRODUCTION

This section describes the functional analysis conducted on the DoD 5000.2R Chapter II project management requirements. This functional analysis was conducted to fully identify the functions required to be performed or tailored. The results of this
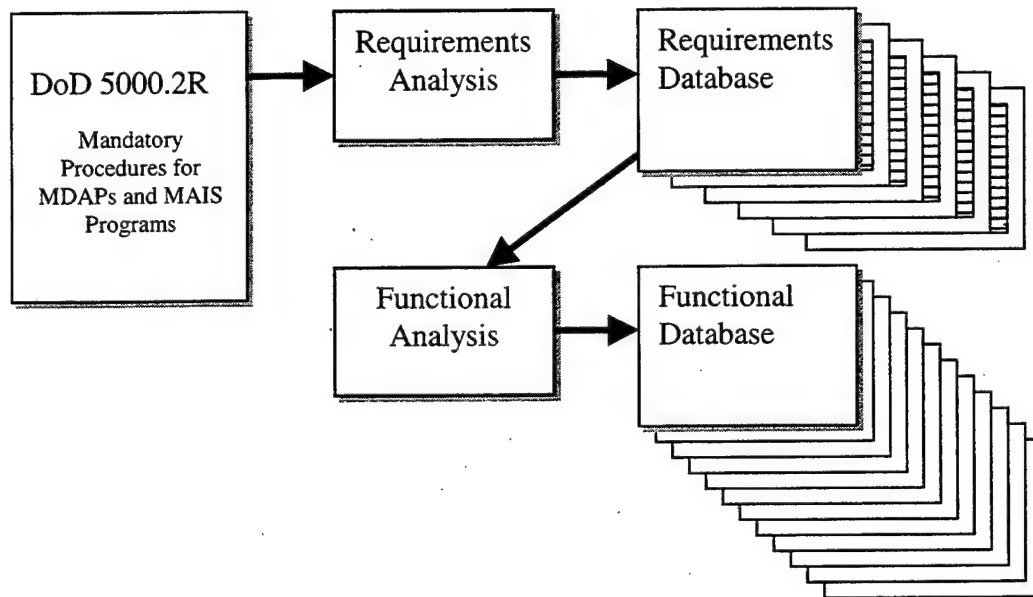
Figure 4. Functional Analysis Context (Source: Developed by Researcher)

analysis provide a list of functions, the Functional Database in Figure 4, along with those requirements these functions must meet. This listing follows the systems engineering process (IEEE, 1995) as a "functional architecture."

B.   METHOD OF FUNCTIONAL ANALYSIS

1.   Introduction

This analysis was conducted using a process described in IEEE P1220 (IEEE, 1995). The analysis process was tailored to one source for requirements. The tailoring is presented in Table 4.

Table 4. Tailoring of Functional Analysis (Source: Developed by Researcher)

Task No.	IEEE Task	Order Used / Not Used
6.3.1.1	Define Subfunctions	1.
6.3.1.2	Define Functional Interfaces	1.
6.3.1.3	Allocate Performance Requirements	2.
6.3.2	Analyze Functional Behaviors	Not Used
6.3.3	Define Subfunction States & Modes	4.
6.3.4	Define Functional Timelines	3.
6.3.5	Define Data & Control Flows	5.
6.3.6	Define Functional Failure Modes & Effects	Not Used
6.3.7	Define Hazard Monitoring Functions	Not Used
6.3.8	Establish Functional Database	6.

All portions of Steps 1 and 2 were conducted in conjunction with the requirements analysis described in Section II of this thesis. The flow of tasks performed on each DoD 5000.2R statement was from requirements analysis to functional analysis. This flow was organized after realization of the magnitude of requirements in this one document.

2. The Analysis

Step 1.	6.3.1.1 Define Subfunctions	6.3.1.2 Define Functional Interfaces
Step 2.	6.3.1.3 Allocate Performance Requirements	
Step 3.	6.3.4 Define Functional Timelines	
Step 4.	6.3.3 Define Subfunction States & Modes	
Step 5.	6.3.5 Define Data & Control Flows	
Step 6.	6.3.8 Establish Functional Database	

Figure 5. Tailored Functional Analysis Steps (Source: Developed by Researcher)

a) Step 1. Define Subfunctions and Functional Interfaces

After a requirement statement was documented and analyzed for performance or functional content, it was then decomposed. This decomposition consisted of determining if the statement required additional, undocumented subfunctions to take place. If so, the detailed requirements were decomposed into additional functions. For instance, requirements to "report" the results of analysis created an implied

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requirement to first conduct an analysis. This lead to at least two functions for one explicit requirement. This type of requirement was common in DoD 5000.2R.

This decomposition establishes a number of functional interfaces. Where an interface was not clear between two subfunctions, an additional interfacing function was identified. For instance, if the analysis report was extensive and implied a great deal of effort to write, then documenting the analysis is an additional function. Interfacing functions were not ordinarily needed, due to the detailed nature of the DoD 5000.2R requirements.

b) Step 2. Allocate Performance Requirements

Allocating performance requirements for this analysis was more a case of inheritance than allocation. The nature of performance requirements in this document were schedule-oriented, requiring that a series of subfunctions be completed prior to a certain milestone or during a certain phase. Allocation of time among these subfunctions is greatly dependent on program-specific elements. Therefore, any performance requirements were inherited by all affected subfunctions.

c) Step 3. Define Functional Timelines

Timelines for acquisition project management functions were developed in three time scales. These include life cycle process, development process, and systems engineering processes.

DoD 5000.2R provides clear distinction between the functions performed by the project office during the seven life cycle phases (development, test and evaluation,

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production, fielding, training, operations, support, and disposal). There were requirements allocated to all phases with the development phase having by far the most requirements.

Timelines for development phases were defined in the development model presented in Part I of DoD 5000.2R. This model is subdivided by formal "Milestone Decisions," which provide authority to continue into the next development phase. The phases consist of pre-milestone 0 (Determining Mission Needs and Identifying Deficiencies), Phase 0 (Concept Exploration), Phase I (Program Definition and Risk Reduction), and Phase II (Engineering and Manufacturing Development).

Further, DoD 5000.2R requires a systems engineering process be used in project management. This process consists of five, separate, major tasks: requirements analysis, functional analysis, synthesis, analysis, and control (DoD 1998; IEEE 1995). These tasks are performed during each phase of development at progressively more detailed levels (DoD 1998).

d)   Step 4. Define Subfunction States and Modes

For the purposes of this analysis, a state is defined as the behavior of a subfunction at a particular point in time. A mode is defined as an operating condition in which there are typically many states (IEEE, 1995).

Modes for an acquisition project were clearly defined along life cycle and development phase lines (Step 3, above). While many functions are repeated for each phase of development, the level of detail considered in each phase is very different. Thus,

functions were assigned to the life cycle process and then, if part of the development process, to the phase for which they were required.

Functions from the database were further allocated within development phases to specific systems engineering tasks. This provided insight into the reasoning for using each function in that particular phase. Systems engineering tasks do not really present independent states, in that several tasks may be going on at once. These tasks are better considered, in this context, as submodes.

e) *Step 5. Define Data and Control Flows*

Data and control flows are embedded in the DoD 5000.2R requirements and were identified during establishment of modes down to the systems engineering task level. This step was conducted to ensure these flows were identified, if required.

The primary project level data and controls are established by DoD 5000.2R through a series of four formal milestone decisions during development. These milestones utilize data from the systems engineering process and project control functions conducted during the previous phase to decide whether to continue into the next phase of development. Project control functions include capture of changes in the system, technical management (data, configuration, interfaces, risk and progress), life cycle performance tracking and updating of plans and estimates. This primary flow is presented in Figure 6.

26
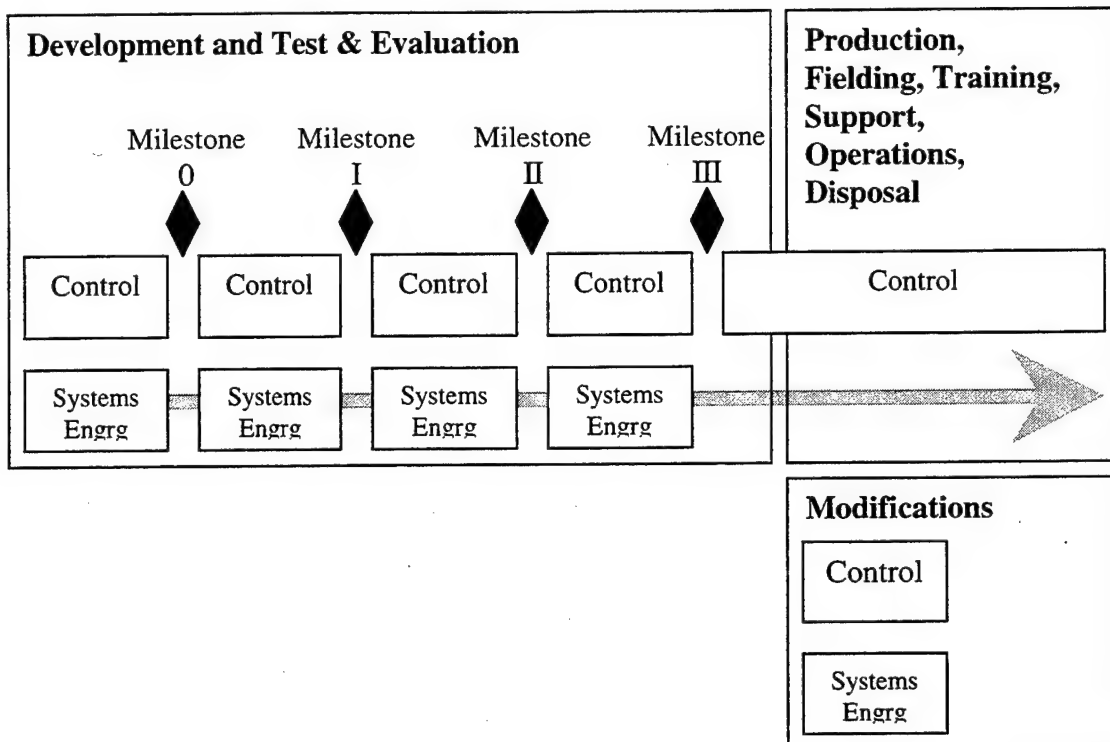
Figure 6. Primary Project Level Data and Control Flow (Source: Developed by Researcher)

f) Step 6. Establish Functional Database

A database was prepared to hold the information captured in both the requirements and functional analyses. This database allowed allocation of each requirement to all portions of the life cycle of project management to which it applied. This capability was used extensively to capture the iterative nature of the acquisition development model.

3. Tools

The functional architecture was assembled in a relational database supporting all relevant information from DoD 5000.2R detailed requirements. The database was built in digital format using Microsoft ACCESS 98. The Excel spreadsheet containing the

requirements database was imported into ACCESS, and then modified to the final configuration.

4.   Adjustments to the Requirements Database

The Functional Database was captured in a relational database. The Requirements Database was in spreadsheet form. The construction of a relational database from the Excel-based flat database required introducing a number of inter-related tables. These tables contain the information from the requirements database, in associated tables, plus the additional information gained from the functional analysis. The following Table 5 and Figure 7 describe this relational database.

Table 5. ACCESS Functional Database Configuration (Source: Developed by Researcher)

Table Name	No. of Records	Field Names
DoD 5000.2R	442	Entry No
		Section No
		Section Title
		Quotes
Derived Requirements	864	Rqmt No
		Subject
		Function
		Object
		Modifier
		Using
		Timing
Reference	888	Rqmt No
		Entry No
SE	6	SE Function
		SE Code
When	2960	Rqmt No
		SE Code
		Sort Order
		When No
Sort Titles	16	Sort Order
		LC Function
		Phase

28
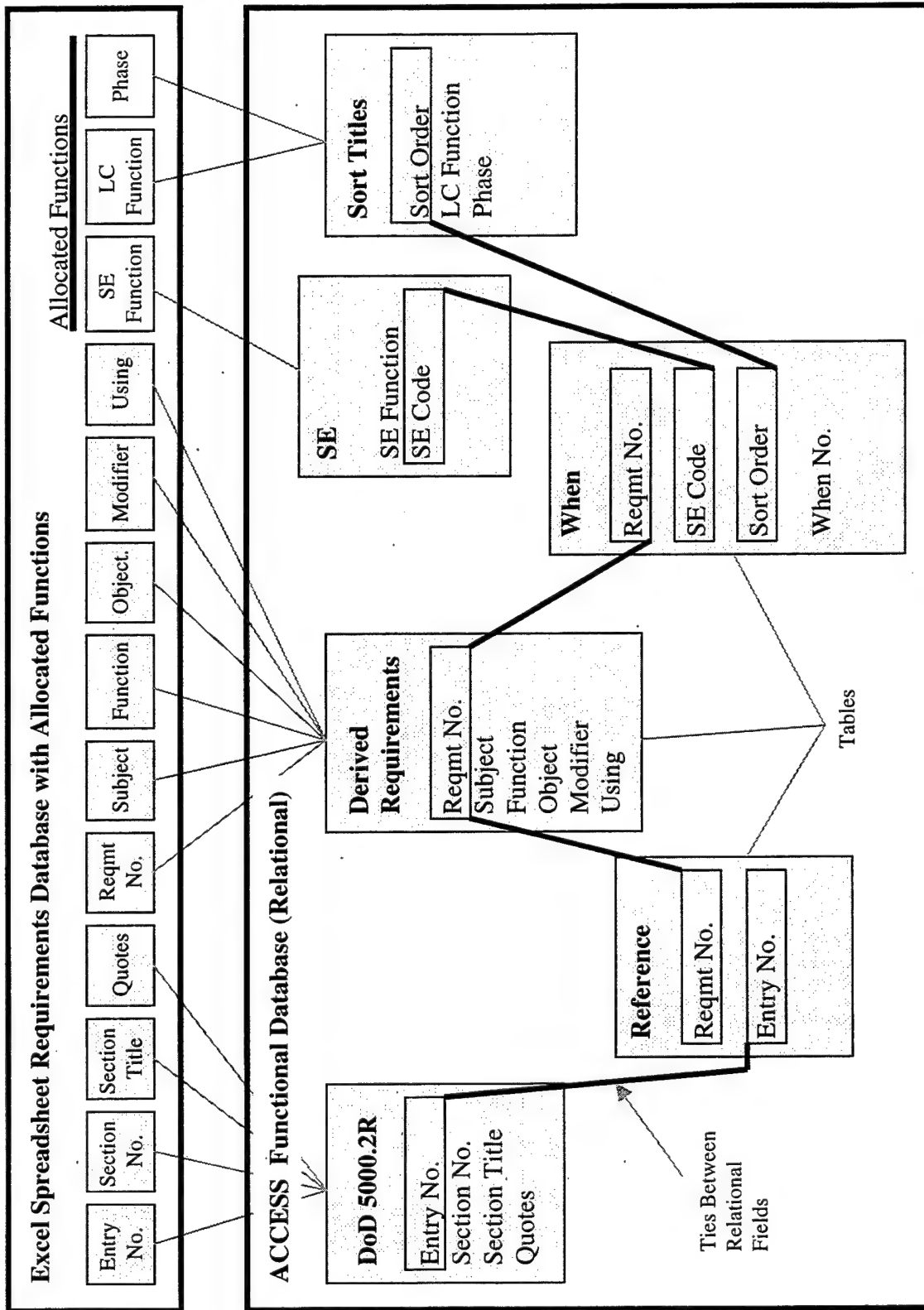
Figure 7. Transformation of Excel Requirements Database to ACCESS Functional Database
(Source: Developed by Researcher)

C.   FUNCTIONAL ANALYSIS RESULTS

The six steps of the functional analysis established the connections between the functions and the timing. The total number of allocated functions was 3,040.

Of the 3,040 required functions, 2,744 were to be performed by the PM, 61 by the MDA and 199 by both. The User is responsible for performing 32 of these functions and all three positions get four functions.

The primary cause of increases in functions from the baseline to the allocated functional architecture is the establishment of a timeline. By assigning functions to timelines, the iterative nature of the required development becomes apparent. Many required functions were conducted "throughout the development" or "during each phase" (DoD 1998). Iteration in this case significantly multiplied the number of functions. Care was taken during development of this database to only assign required functions when they were consistent with work expected during phases of the acquisition process as described in DoD 5000.2R Part I. However, if a case could be made for conducting a function in a particular phase, it was so assigned.

For iterative timelines, an issue encountered was the assignment of functions to time periods prior to "Milestone 0." A systems engineering process is considered necessary by DoD acquisition education sources during early consideration of mission needs prior to Milestone 0 (Gunther, 1995). These early functions are understood by the author to be conducted by an organization that is either a project within a research and development organization, a doctrine and requirements organization, or an existing

project office considering an new product. These early requirements were assumed to be included in the timelines associated with the functional architecture.

D.   DATABASE DEVELOPMENT

The functional architecture was captured using a relational database. The strength of a relational database is the separation of unique information into separate files. This reduces the size of any one file and reduces the input work required to describe a set of data. Additionally, it clarifies classification of data and facilitates approaches to analysis. This database used tables to classify DoD 5000.2R requirements from two distinct perspectives, timeline and source.

1.   Timeline Perspective

Three tables were developed to allow categorizing of requirements by timeline and allow for iteration of a large number of functions (see Figure 7).

The first of these tables named "Sort Titles" was developed to allow sorting of requirements by life cycle function (field: LC Function) and development phase (field: Phase) during which they are to be performed. A unique record number was assigned as a key field.

The second table was developed to accept the requirements of DoD 5000.2R to iterate the systems engineering process. This table, named simply "SE," contains the five systems engineering functions (field: SE Function) and an "All" value. There is also an identifier (field: SE Code) for use as a reference. While containing only two fields, this

table was maintained as separate from other tables to allow future elaboration on systems engineering functions using additional fields.

The third table, named "When", ties the other two into one or more time references for each requirement. The life cycle function and phase identifiers are used in conjunction with the systems engineering identifier to tag each requirement with the timings identified by DoD 5000.2R. Requirements are identified by their unique requirement number (field: Rqmt No). A unique identifier was also established for each record in this table (field: When No).

2.   Source Perspective

Two tables were used to establish DoD 5000.2R sources for each requirement (see Figure 7).

The first, named "DoD 5000.2R", contains the original quotes and section identification for requirement statements taken from the regulation. This includes a section number (field: Section No), a combination of section number and title (field: Section Title) and the statement in regulation language (field: Quote). Additionally, a number was used to identify the order these statements were taken from the regulation. This number (field: Entry No) is unique for each statement.

The second table, named "Reference", simply ties each requirement to the statement from which it was derived. This is done by tracking unique combinations of requirement number and entry number.

E. CHAPTER SUMMARY

A functional analysis was conducted on the requirements obtained from DoD 5000.2R. The results of the functional analysis are contained in a relational database and are called the "functional architecture" of these requirements. Of particular note is the timeline nature of this architecture. Requirements in the DoD 5000.2R to perform functions in an iterative nature multiply the number of original requirements to a very large number (2744) of Project Management functions.

IV. QUANTITATIVE AND QUALITATIVE ANALYSES

A. INTRODUCTION

Both quantitative and qualitative analyses were conducted to analyze DoD 5000.2R and its level of control on DoD acquisition project management. The quantitative analysis described in this section identifies the requirements drivers leading to the large number of allocated functions. The qualitative analysis analyzes the drivers on DoD management, as executed through the DoD 5000.2R.

B. QUANTITATIVE CHARACTERISTICS.

A quantitative Pareto analysis of the Functional Database was conducted to determine the causes of the large number of requirements (see Figure 8). A Pareto analysis contends that a minority of causes contain the majority of requirements.

Pareto analysis identifies the vital few causes to guide further investigation. Typically, the percentages reflect that the top 20% of categories by number of functions contain 80% of the total number. These "20/80" percentages were for the Pareto analysis results presented in this section. The analysis consisted of "drilling down" until either a particular source for this large number of requirements could be located or the Pareto chart showed there were no drivers present.
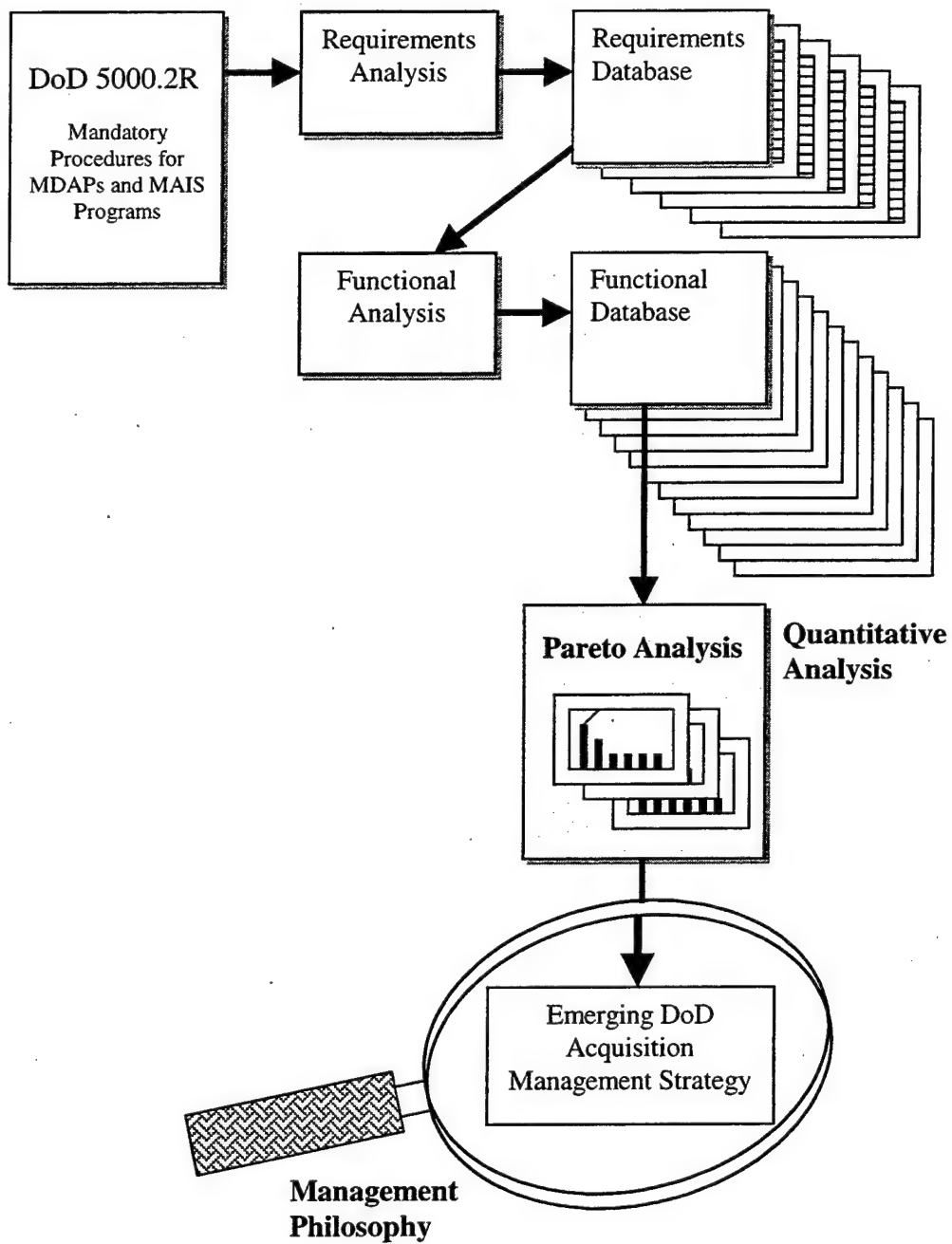
Figure 8. Quantitative Analysis Context (Source: Developed by Researcher)

1. Life Cycle Requirements Breakdown

The initial analysis was conducted at the top level, which covers the life cycle functions: Development, Test / Verification and Validation (VandV), Production, Fielding, Training, Support, Operations, and Disposal. An additional category for System Modification was added to accept a requirement not applicable to normal development. Each of these nine functions was examined for number of requirements allocated in the Functional Database.

Results (

Chart 1) show that 93% of the DoD 5000.2R allocated requirements applied to the development portion of the system's life cycle. These results compare with the next highest function, Test/VandV, which accounts for only 2% of the total number. This shows Development to be the driver in DoD 5000.2R requirements. This illustrates that the regulation is highly focused on development of systems, instead of providing guidance on systems life cycle management. This implies DoD policy makers are not as interested in support of the portion of acquisitions that provide continuing capability after development.

2. Requirements Distribution Among Development Phases

To continue the investigation, requirements allocated to development were analyzed by phases and milestones as described in DoD 5000.2R, Part I. These include four phases (Pre-Milestone 0, Concept Exploration, Program Definition/Risk Reduction, and Engineering/Manufacturing Development) and four milestone decisions (Milestones 0, I, II, and III).

Chart 1. Pareto: Number of Requirements by Each Life Cycle Function (Source: Developed by Researcher)

38
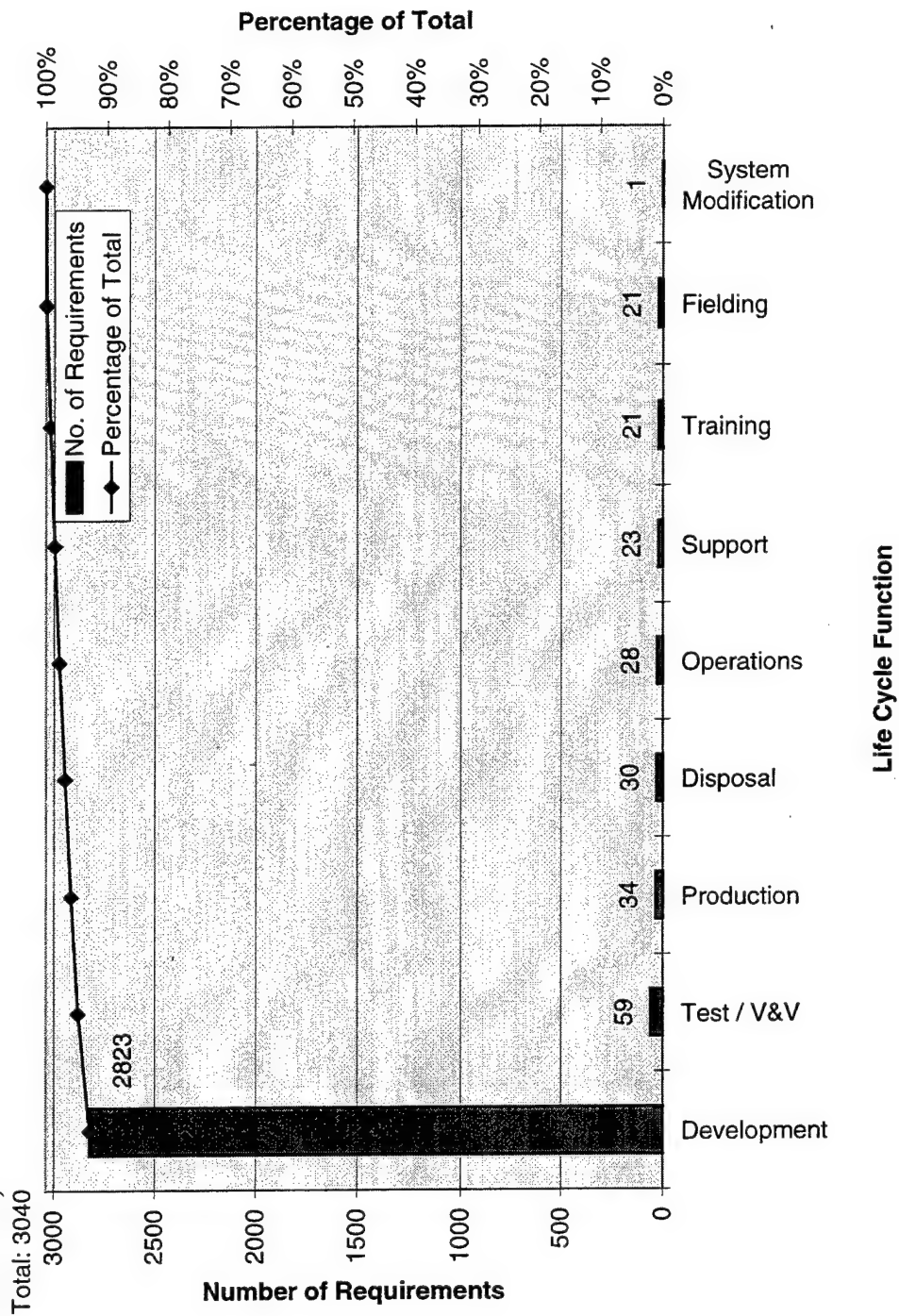
The number of functions for each phase was approximately equal as were the number of functions for each milestone (see Chart 2). This is to be expected given the iterative nature of DoD 5000.2R Part I acquisition process. Iteration is not only required by DoD 5000.2R but also by the systems engineering process (Gunther, 1995).

The Concept Exploration phase was allocated the most requirements (680). The phase allocated the least was pre-milestone 0 with 615. Milestone I, the exit decision for Concept Exploration, was allocated the most requirements of the milestones (63).

Differences in numbers of requirements among the phases and milestones are due to some changes in requirements as system development matures.

3. Systems Engineering Function Requirements Distribution for Concept Exploration Phase

Examining one phase at a time allows further exploration of requirements drivers without the amplifying effects of repetition. Concept Exploration was analyzed for requirement distribution among the required systems engineering functions.

The results indicate there are requirements drivers (see Chart 3). Synthesis was allocated 48% of Concept Exploration requirements. Synthesis is the consideration of alternative ways to accomplish the functional architecture. It is also the selection and documentation of the result. Concept Exploration synthesis provides decisions affecting system level specifications, acquisition strategy, funding profiles and other plans that lay out the system life cycle.

Synthesis performed during Concept Exploration accounts for 10.7% of the total number of project requirements identified in DoD 5000.2R.

Chart 2. Pareto: Number of Functions by Phase of Development (Source: Developed by Researcher)
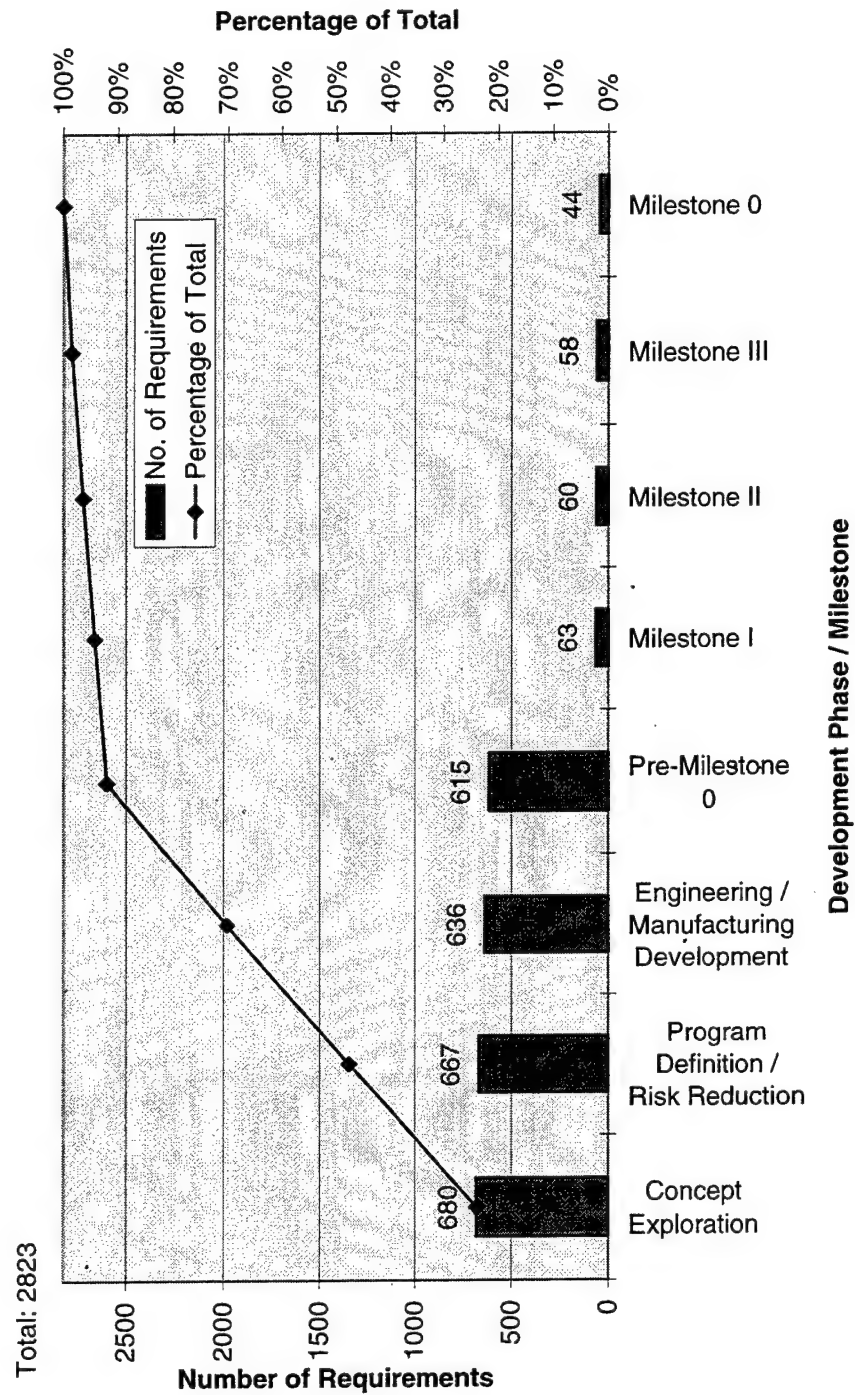
Chart 3. Pareto: Number of Requirements by Systems Engineering Function of Concept Exploration (Source: Developed by Researcher)
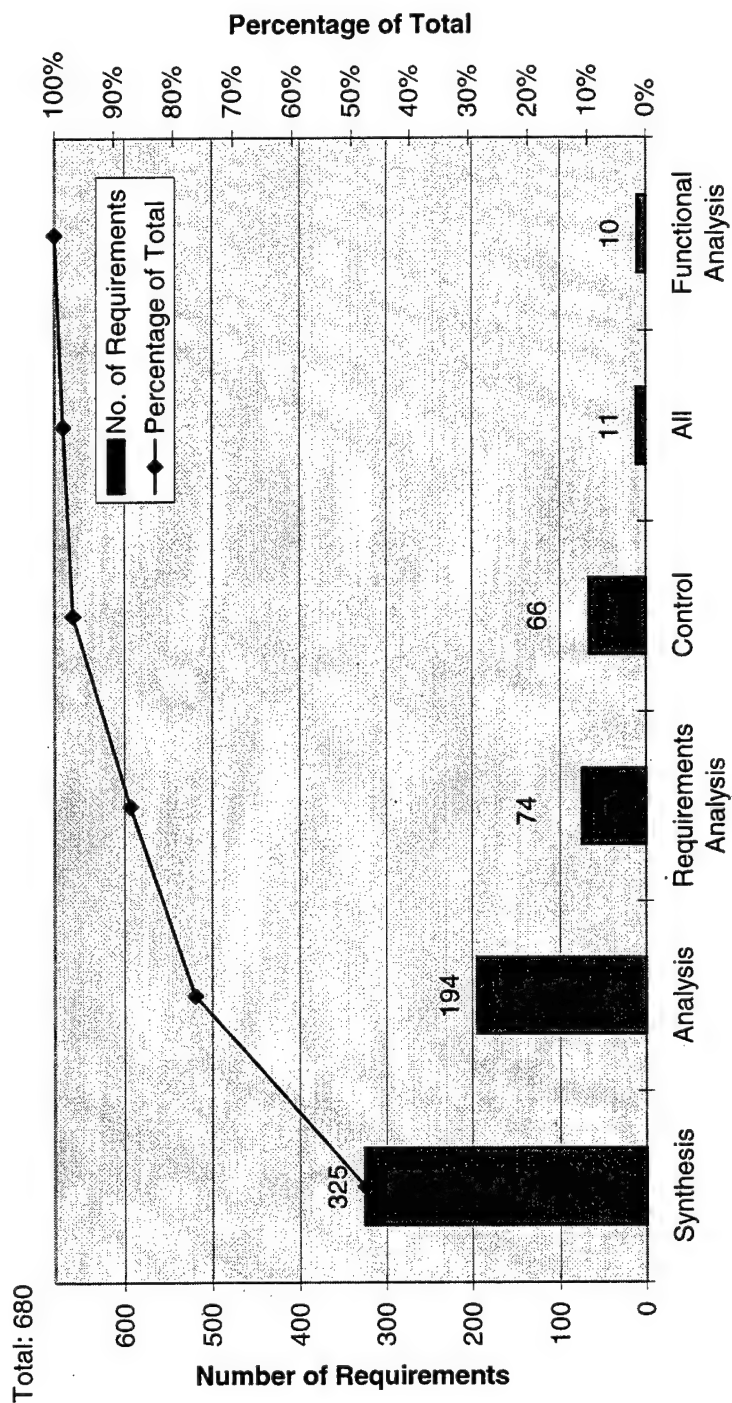
4. Requirement Distribution for Concept Exploration Synthesis

There are three subjects: the Project Manager (PM), the Milestone Decision Authority (MDA) and the User. Subject is defined here as the individual who must perform the required function.

The number of Concept Exploration synthesis requirements were determined for these subjects (see Chart 4). The PM accounted for 97% of the total number, making this individual the performer of the vast majority of requirements. The PM is the primary subject of requirements in this regulation. This was overwhelmingly true in all queries made on the database, based on subject. The Project Manager performing Synthesis during Concept Exploration phase is allocated 10.4% of the total number of project requirements identified in DoD 5000.2R.

5. Task Requirements Distribution for the PM During CE Phase Synthesis

For more detail on the emphasis placed on the PM, a distribution of requirements for all identified tasks to be performed was analyzed. During requirements capture, a common list of verbs was used to allow categorization by action. The title given these entries in the function list was "tasks."

The number of requirements for the PM during Concept Exploration synthesis were categorized by "task." (See Chart 5.) The results indicate a weak Pareto distribution, singling out four tasks as the primary requirements drivers. These tasks were "use," "plan," "establish," and "consider."

Chart 4. Pareto: Number of Requirements by Subject for Concept Exploration Synthesis (Source: Developed by Researcher)
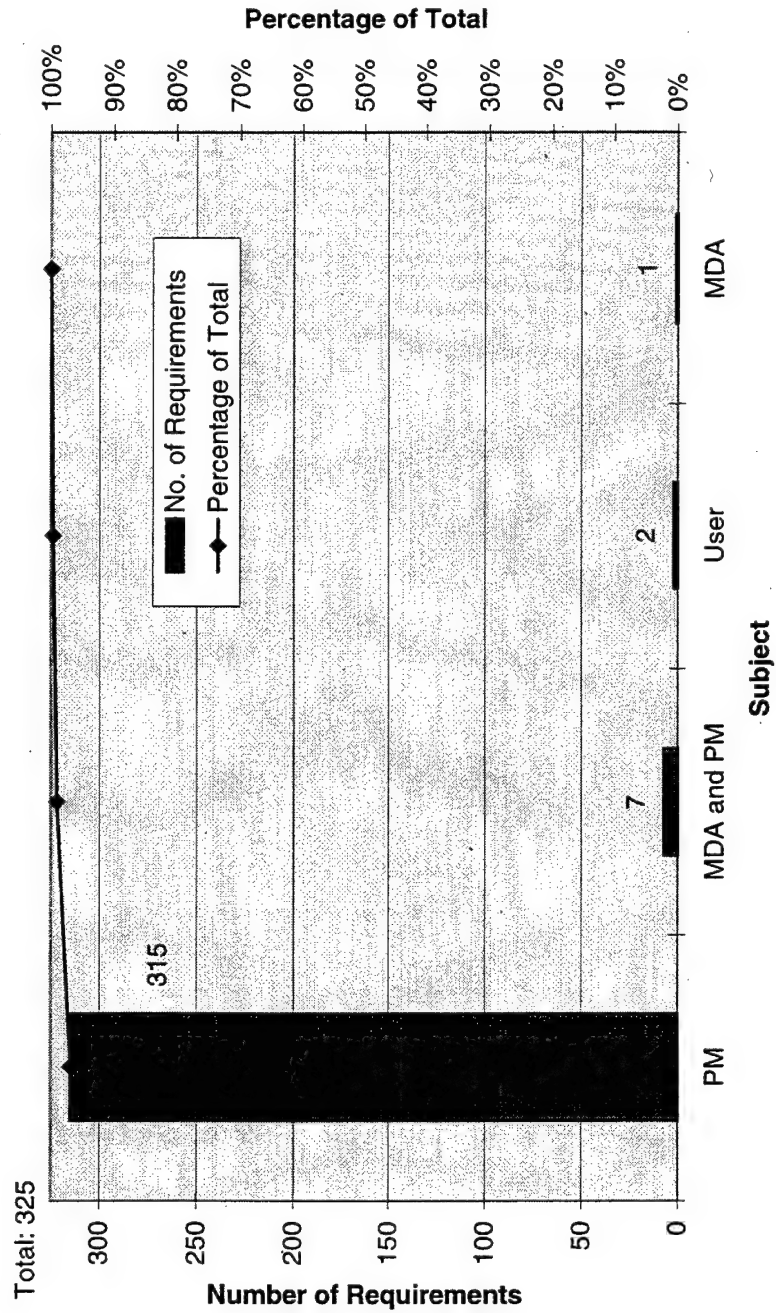
The majority of requirements which emphasized "use" and "consider" focused on directing or influencing system solutions chosen during synthesis. These tasks to be accomplished by the PM during Concept Exploration Synthesis account for 37.5% of the total number of project requirements identified in this analysis.

Requirements emphasizing "plan" and "establish" were constraining the design of the development process. These tasks for the PM during this phase were allocated 33.3% of the total number of project requirements identified in this analysis.

6. Further Investigation of Requirements for the PM During CE Phase Synthesis

Further investigation of the four driving tasks was conducted to isolate requirements drivers. Each task was analyzed for the number of requirements by "object" of the task. An object is the receiver of any action taken. An example is the requirement to use a Work Breakdown Structure. Use is the task and "Work Breakdown Structure" is the object. Objects of this nature were identified for all requirements identified in DoD 5000.2R.

All four tasks identified as drivers were analyzed (Charts 6-9). These showed relatively flat distributions, eliminating Pareto analysis. The largest number of requirements allocated to any of these objects was for an integrated data management system (11), allowing no conclusions to be made.

The flat distributions indicate that the chosen path of investigation with this functional architecture is exhausted. No further requirements drivers from DoD 5000.2R, based on this line of investigation, can be clearly identified.

Chart 5. Pareto: Number of Requirements by Task for the PM During Concept Exploration (Source: Developed by Researcher)

45
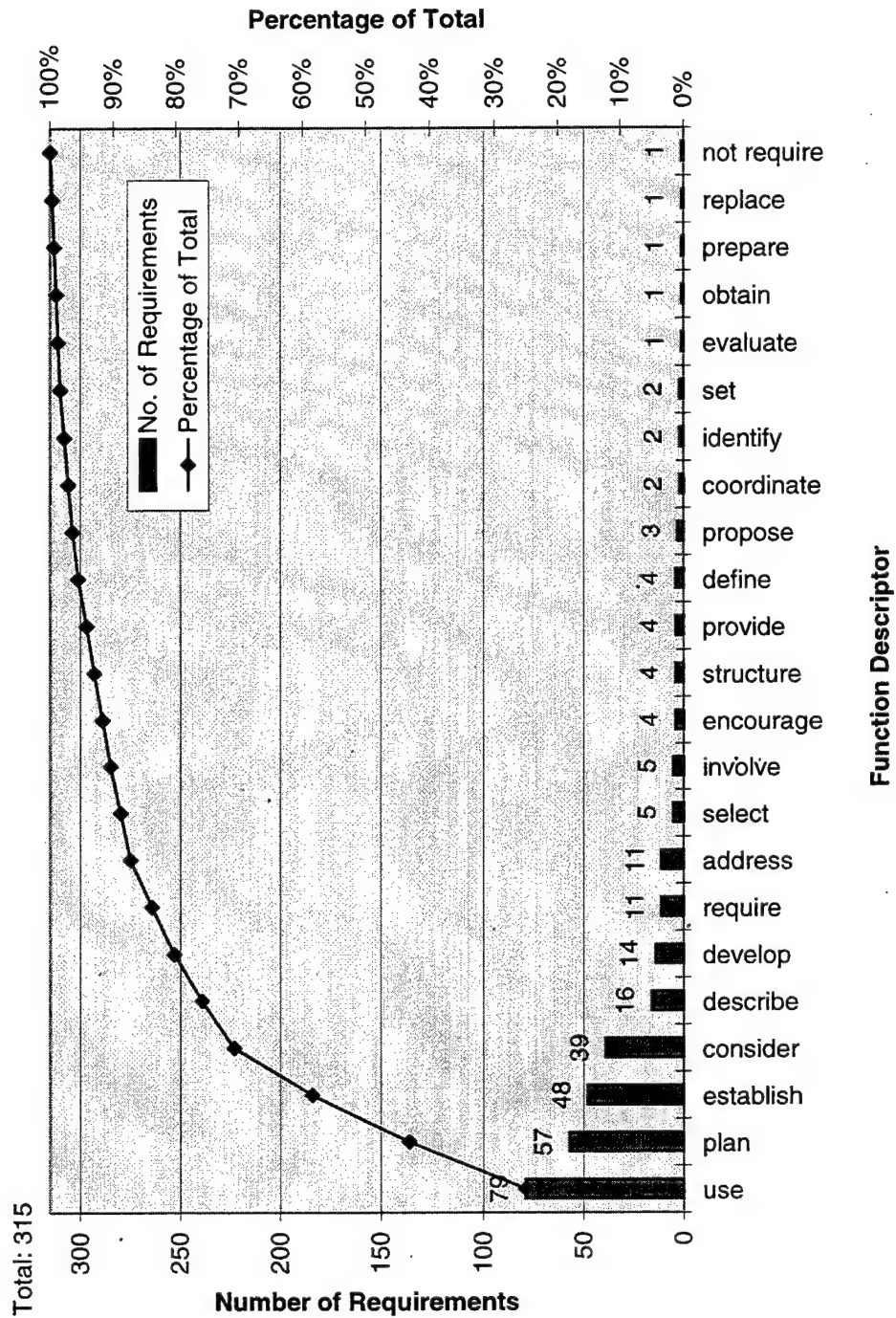
Chart 6. Pareto: Number of Requirements by Object for "use" Tasks of the PM during Concept Exploration Synthesis (Source: Developed by Researcher)
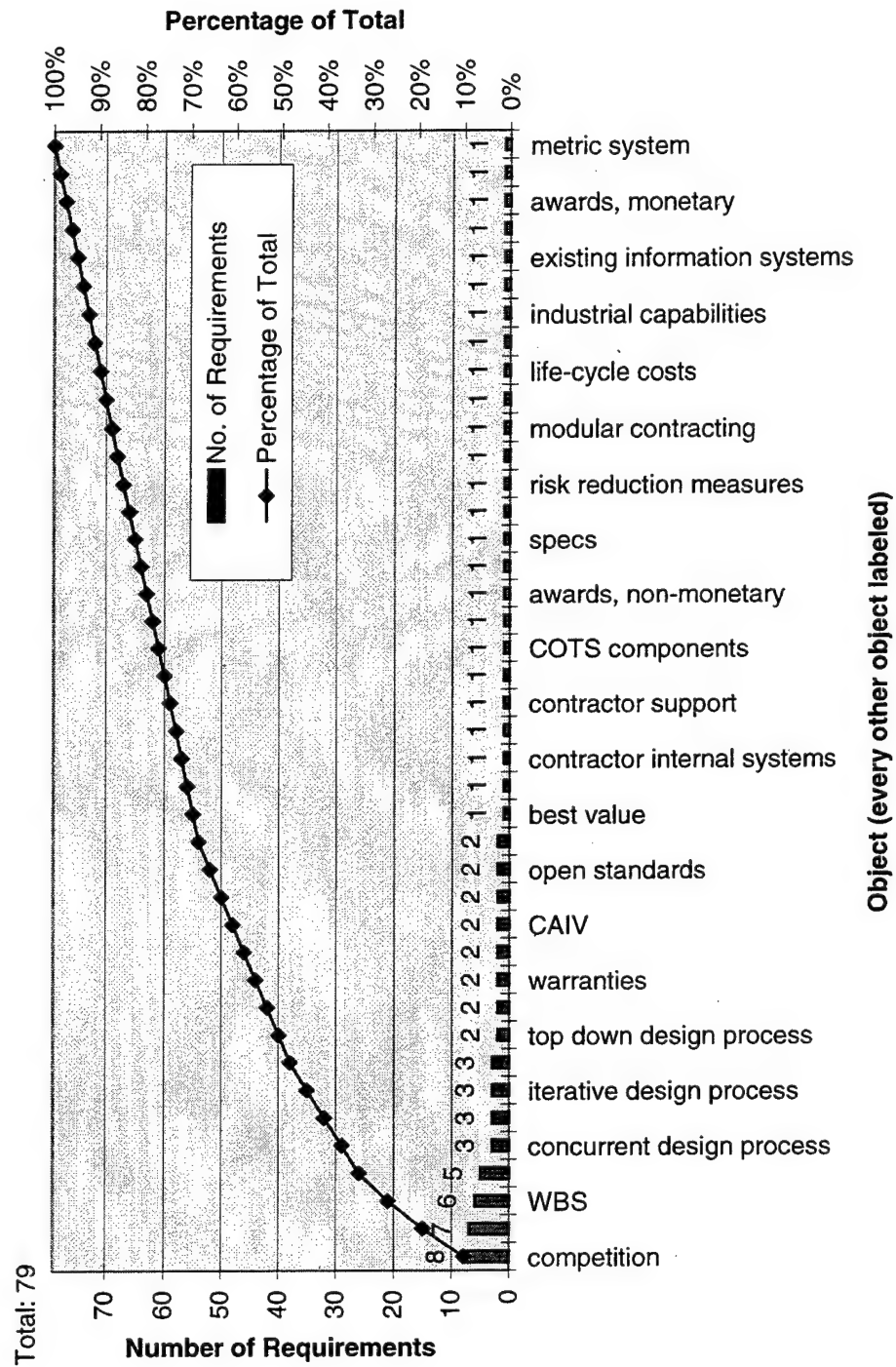
Chart 7. Pareto: Number of Requirements by Object for "plan" Task of the PM during Concept Exploration Synthesis (Source: Developed by Researcher)

Total: 57

Percentage of Total

Number of Requirements

Object (every other object labeled)

- storing procedures
- MOEs
- open standards
- overall test structure
- program stability
- minimizing use procedures
- methods of data reduction
- technology transition
- test limitations
- threat simulation
- transporting procedures
- disposal procedures
- analyses
- back-ups
- competition
- continuous risk assessment
- alternative lethality testing
- IDE
- maintainability activities
- methods of data analysis
- contract oversight
- modeling and simulation
- data collection

No. of Requirements
Percentage of Total

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Chart 8. Pareto: Number of Requirements by Object for "establish" Task of the PM during Concept Exploration Synthesis (Source: Developed by Researcher)
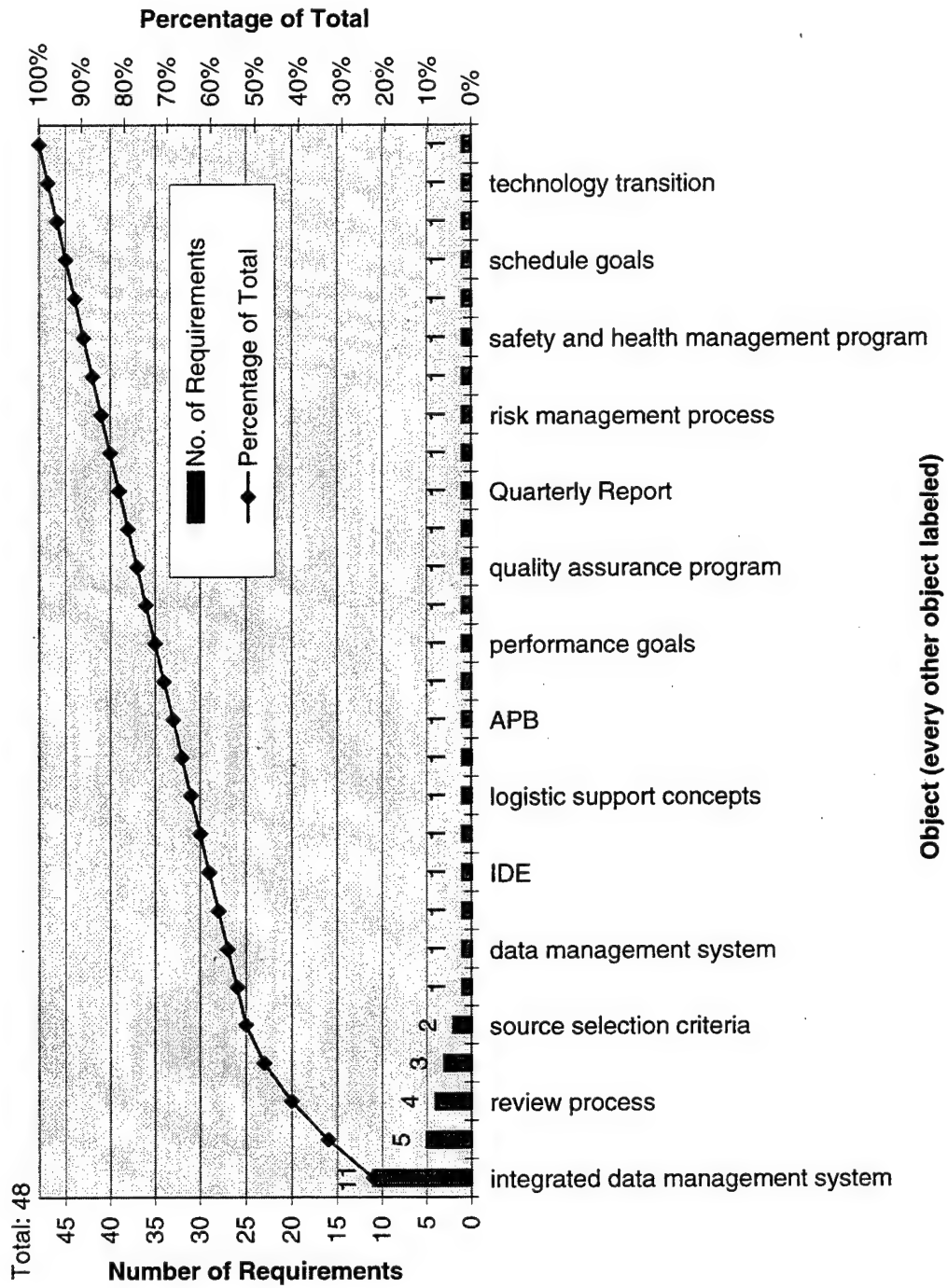
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Chart 9. Pareto: Number of Requirements by Object for "consider" Task of the PM during Concept Exploration Synthesis (Source: Developed by Researcher)
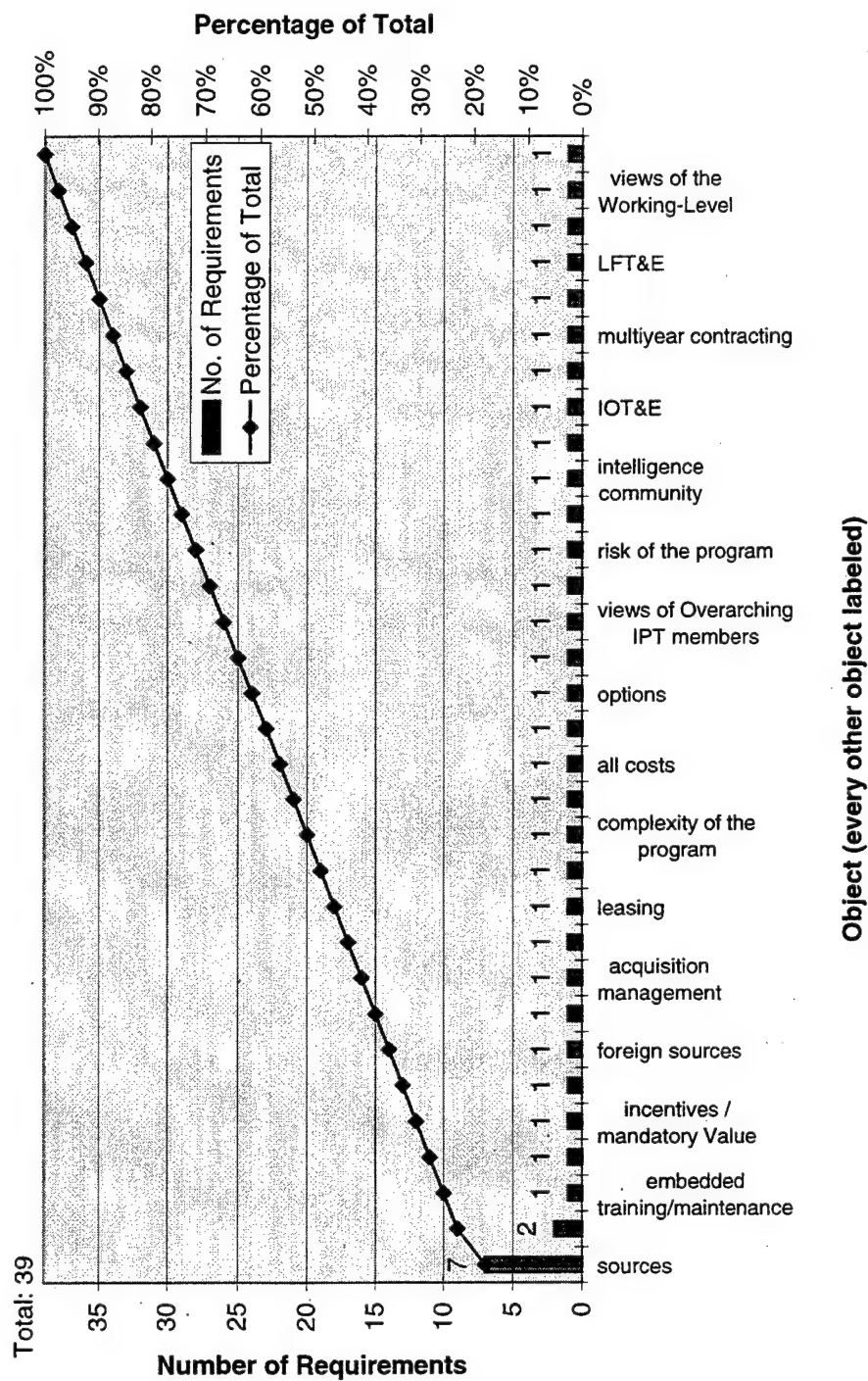
C. QUALITATIVE CHARACTERISTICS

1. Implications as a Communications Tool

To evaluate the functional architecture from a qualitative perspective, an analysis of DoD 5000.2R as a communication tool was performed. A strategic contingency communications model (Figure 9) was used to address aspects critical to accomplishing this regulation.

Situational Factors	Strategy Design Factors	Government Results: Communication and Management Outcomes

Objectives for Communicating
•To inform
•To influence attitudes
•To affect behavior
 	
Audience
•Immediate
•Primary
  -Personal Profile
  -Topic / Situation
•Secondary
 	
Management Situation
•Nature of routine
•Org state
•Leadership styles
 	
Sender
•Position
	Message
	•Content
	•Tone
	•Analysis
	•Style
	•Quality of Requirement Statements
	•Choice of Media
	•Length
	•Timing	

Figure 9. Tailored Communications Model (adapted from Garnett, 1997)

a) *Order to Reduce Federal Regulations*

On 11 September 1993, President W.J. Clinton ordered the executive branch of the federal government to reduce the number of regulations not required by law. The goal was reduction by 50% within 3 years. The executive order was given to improve federal government productivity, and to streamline operations (EO #12861, 1993).

DoD 5000.2R was an answer to Executive Order 12861 and was intended to minimize the volume of mandatory guidance (Kaminski, Coyle, Paige, Mar 1996).

b) *Objectives for Communicating*

There are three categories of objectives for government communications; to inform, to influence attitudes, and to affect behavior (Garnett 1997). The purposes for DoD 5000.2R (presented in Section II of this thesis) indicate that all three categories apply.

(1)   To Inform.   The first objective of DoD 5000.2R is to inform acquisition personnel of mandatory procedures required by DoD. DoD procedures include a wide variety of initiatives on all processes including acquisition. A primary objective stated in DoD 5000.2R is to frame the acquisition process with formal reviews. This provides control of project progress throughout the life cycle. While this establishes the milestone decisions, DoD 5000.2R also includes teamwork, tailoring, empowerment, cost as an independent variable (CAIV), commercial product use, and best practices (Kaminski, Coyle, Paige, 1996). After Changes 1 and 2 of DoD 5000.2R were implemented, the number of DoD constraints grew with Change 3. In this change, a

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significant number of "will" statements were changed to "shall" statements. This implies mandatory requirements.

(2)   To Influence Attitudes.   DoD 5000.2R answers the concern that previous DoD acquisition policy documents were "unwieldy and too complex" (Kaminski, Coyle, Paige, 1996) and this fosters an attitude among PMs to avoid following the regulation where possible. The framework of milestone decisions and other constraints were intended to be a "simplified and flexible management framework" (DoD 1998).

(3)   To Affect Behavior.   Through mandatory procedures -- whether supporting controls, "themes", or statute -- the DoD 5000.2R is intended to standardize the acquisition project. This is done by mandating a large number of steps as a model to be tailored. In this way, control is maintained over the planning and execution of acquisition projects across all projects and program offices.

c)   *Audience*

The audience of a particular communication can be divided into three categories.

(1)   Immediate Audience.   The immediate audience are those that route the message to the primary audience. For DoD 5000.2R, the immediate audience is the staff of the office of the Under Secretary of Defense (Acquisition and Technology) who assembles the document and coordinates changes.

(2)   Primary Audience. Primary audiences are those who make decisions and act on information contained in the message. The strategic communication model used for this analysis contains an audience profile which provides some insight to DoD 5000.2R intended primary audience. This profile consists of two main parts, the personal profile and the topic and situation profile.

(a)   Personal profile.

The personal profile resulting from the Functional Database is that of a Government Project Manager with a broad technical project management background and experience.

A personal profile is used to identify personal characteristics of the audience. These characteristics include name, title, organizational role, routine, age, gender, education level, education field, professional experience, geographic identification, group affiliations, and preferences.

As mentioned in this thesis, most requirements were identified for the Project Manager.

In the Functional Database, there are an overwhelming number of requirements for technical analyses without explanation or instruction. These analyses imply a schema, or previous understanding of the domain by the primary audience (Hirsch 1997, 51). DoD 5000.2R's effectiveness depends on the audience's understanding of what these analyses produce, how they are accomplished and how they are coordinated.

Studies indicate successful leaders and managers require broad experience and competence in the field of their organization's endeavor (Kotter 1992, 102 ; Mintzberg 1992, 13 ; Schein 1980, 130). For technical projects, this implies a broad technical background, not only in training, but in experience. The

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requirement for the PM to use Integrated Product and Process Development (formally called concurrent engineering) and systems engineering, both specialized engineering functions (OUSD A&T, 1998)(IEEE, 1994), implies significant experience and expertise in engineering management.

(b)   *Topic and Situation Profile*

The topic and situation profile developed from the functional architecture is mixed between experienced professional and inexperienced novice.

The language and topics discussed indicate experienced technical managers are the audience. Additionally, DoD 5000.2R information is delivered in complex sentences. This requires a methodical analysis to decipher specific requirements, and implies an audience of very experienced professionals, with lots of time to study the document.

In contrast, a large number of simple requirements in some areas suggest an inexperienced audience. The simple areas are centered around systems engineering and the use of best practices in technology, analysis, and management. One version of the systems engineering process is presented in a lot of detail. This type of guidance, along with requirements stressing six "themes," presents an elementary view of one version of project management. This simple minded direction toward one process is indicative of what organizational studies recommend for management of personnel with low ability and technical knowledge (Schein 1980, 131). This form of direction is also seen as applicable to management of jobs with low technological uncertainty and low technological interdependence (interfaces with other organizations) (Cummings and Huse 1996, 285) . Contrary to the above, uncertainty and interdependence are high in DoD acquisition.

To confuse matters further, the systems engineering description in DoD 5000.2R falls far short of providing the guidance required in a standard, such as IEEE P1220-1994. The DoD 5000.2R systems engineering process also includes requirements that are not part of the standard. Other versions of the systems engineering process, such as open systems design (Hitchins, 1992) or architecture driven design (Booch, 1996) are not mentioned. Best practices which are not included in the regulation far exceed those in the Functional Database. Additionally, the "themes", such as "Cost as an Independent Variable", are not defined in the regulation and in fact are still evolving within DoD (Land 1997, 24).

(3) Secondary Audience. Secondary audiences are those who are affected by decisions and actions taken by the primary audience. There is a very large secondary audience to DoD 5000.2R. The procurement of military equipment qualifies as the largest business in the world (Wildavski and Caiden 1997). As the model for all new acquisitions, DoD 5000.2R affects millions of people around the world. The interpretation and execution of this regulation affects organizations from industrial contractors to military combat units.

d)   *Management Situation*

To analyze the management situation using the communication model, four characteristics are identified. These characteristics are the nature of management routine, organizational state, primary leadership style, and organizational mission and culture.

(1) Nature of Management Routine. The nature of routine and standardization in DoD acquisition is one of increasing control exercised through this regulation. The number of requirements in the Functional Database is also indicative of the desire for high levels of standardization.

(2) Organizational State. The state of DoD is one of financial focus. Emerging from the Cold War as the premier military power in the world, DoD finds itself consumed with the cost of maintaining strength at much reduced funding levels (Wildavsky and Caiden 1997). The DoD acquisition organization focuses on funding and the management of system life cycle costs. These are prominent in the regulation's "themes" (Kaminski, Coyle and Paige 1996) and the many requirements for Cost As an Independent Variable (CAIV) and life cycle cost management.

(3) Primary Leadership Style. The leadership style apparent in DoD 5000.2R consists of much more authority than democracy. The amount of freedom to make decisions at lower levels determines the leadership pattern of an organization. The more decisions made by the top level, the more an organization displays an authority pattern (Tannenbaum and Schmidt 1992, 126). The large number of requirements in the Functional Database shifts the amount of freedom from the PM to the authors of DoD 5000.2R.

e) **Sender**

The sender, the Secretary of Defense, possesses formal authority easily recognized by the audience.

f)   *Message*

(1)   Content. DoD 5000.2R contains a very large number of requirements for project management. This is evident from the number of requirements in the Functional Database. Very little language within the document is provided without a "shall." Each use of "shall" provides at least one more requirement and often, in DoD 5000.2R, more than one.

(2)   Tone. This increase of authoritarian tone signals a change in leadership style by DoD to more of an autocratic pattern (Tannenbaum and Schmidt 1992, 126).

(3)   Analysis. No analysis of acquisition process decisions is represented in DoD 5000.2R.

(4)   Style. The language used in this regulation was complex and, at times, convoluted. It is common for sentences to be long and complex, containing multiple requirements. Requirements to conduct analyses are implied by a statement requiring reports of the analyses results. Backing into requirements in this way ensures many mistakes will be made. The explicit permission to tailor many requirements presents additional confusion: exactly what is mandatory and what is not? Mandatory requirements are scattered among those that may be tailored. Just to understand what is actually mandatory requires a lot of time evaluating DoD 5000.2R. Beginning with a high level model of the whole process allows tailoring without fear of omissions. Those requirements that can be tailored are, in essence, guidance. A major problem is the minimal technical and managerial knowledge presented in this regulation.

(5)   Quality of Acquisition Requirement Statements. Due to the large number of project management requirements in the relatively short DoD 5000.2R, a short analysis of this regulation as a requirements document was conducted. Sommerville and Sawyer (1997) provide a set of good practices for documenting requirements (Figure 10).

Requirements Documentation Checklist

☐   Define Standard Templates

☐   Use Language Simply, Consistently and Concisely

☐   Use Diagrams

☐   Supplement Natural Language

☐   Specify Requirements Quantitatively

Figure 10. Requirements Documentation Best Practices (Sommerville and Sawyer 1997)

(a)   *Define Standard Templates*

The statements in DoD 5000.2R do not follow a standard template. Requirements statements vary in complexity and form throughout the document.

A standard description of a requirement increases completeness of requirement statements and makes them easier to read (Sommerville and Sawyer 1997, 141). (This method was used to establish the requirements baseline for this

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thesis.) Database fields were established to extract DoD 5000.2R requirements into a standard template.

      (b)   Use Language Simply, Consistently and Concisely

The regulation was consistent in its use of "will" and "shall" and terms common to acquisition. The language was very complex and unclear, especially when describing multiple requirements with very long sentences.

Simple and concise language makes the requirements easier to read and understand. It reduces the amount of misunderstanding in the document.

      (c)   Use Diagrams

There are no diagrams or figures in DoD 5000.2R. The use of diagrams would provide clear intent in a number of areas. (An example is clarification of the term "iterative," when applied to systems engineering.)

When describing structure or relationships, the use of diagrams is more effective than text and leads to twice the understanding.

      (d)   Supplement Natural Language with Other Descriptions of Requirements

This regulation used no formulae, decision tables, or charts in the main body of the text. Descriptions of the acquisition process in Part I would have benefited from graphic elements or illustrations to amplify the text.

Standard notation, such as decision tables and charts, are more concise, clear and less likely to be misinterpreted than text. This is especially true when communicating with experienced professionals in the subject domain (Sommerville and Sawyer 1997, 141).

(e)   Specify Requirements Quantitatively

There were no quantitative performance standards established in the regulation, other than costs and undefined exit criteria required for reporting back to the MDA. Measures of effectiveness, even if presented as goals, would provide a means of objectively understanding the constraints of DoD 5000.2R. "To the maximum extent possible" and "as applicable" are, perhaps, necessarily vague but would benefit from a hard goal for DoD acquisitions. Quantitative requirements communicate precise constraints to both the developer and the oversight organizations (Sommerville and Sawyer 1997, 141).

g)   Choice of Media

The media chosen was a written regulation distributed in paper and electronic formats. The copy used for this thesis was electronicly downloaded from the World Wide Web from the USD(A&T) server.

DoD 5000.2R was accompanied by the Defense Acquisition Deskbook and internet resources that include related information but not requirements. The choice to support the written regulation with other information sources indicates a "rich media." This suggests that the message included is deemed by DoD to be equivocal and complex (Trevino, Daft and Lengel 1997, 34). The size of the Functional Database confirms the assumption of complexity. However, DoD 5000.2R prohibits supplements by any DoD component and limits implementing documentation to a minimum (DoD 1998). This prohibition implies the regulation is intended as a stand-alone document. As discussed earlier, the style of this document is essentially a list of requirements. The use of lists for

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equivocal, complex messages provides too few cues to the audience, making its effectiveness one of "Communication Failure" (Trevino, Daft and Lengel 1997, 34).

There are other complementary efforts taken to make parts of the acquisition process more understandable. World Wide Web access to regulations were established to allow instant updates of information from the project office. A Project Managers Bill of Rights was written to provide a sense of security to PMs during massive changes in acquisition policy. An Acquisition Deskbook, an ever growing digital reference program, was strengthened, presented and is being updated at least twice a year. The Deskbook provides project offices with a full regulation reference, lessons learned, dictionary and step by step processes.

h) *Length*

The length of DoD 5000.2R is insufficient for the complex message it contains. DoD 5000.2R would be significantly longer if it used a good documentation method for requirements such as that in Sommerville and Sawyer (1997).

i) *Timing*

The timing associated with this regulation has been an average of one change every six months.

2. Implications of DoD Corporate Strategy for Acquisition

The implications of the DoD 5000.2R document on DoD strategy based on level of constraint of acquisition processes are examined in this section.

a)   ***Strategy Defined***

Quinn (1996) defines strategy as "the pattern or plan that integrates an organization's major goals, policies, and action sequences into a cohesive whole." DoD intends to establish "stable, affordable, and well-managed" acquisition programs (DoD 1998). The process to accomplish this is stated as a simplified and flexible management framework for use by the acquisition projects. Communicating this framework is the stated purpose of DoD 5000.2R.

(1)   Simplified and Flexible Management Framework.   The management framework defined in DoD 5000.2R, Part I provides definitions of a process that is dominated by milestone decisions. Other parts of the regulation further define the phases of acquisition and required functions for those phases. Specific requirements may be tailored, an option which creates flexibility in this process.

(2)   Umbrella Strategy.   The intent of the DoD 5000.2R strategy is to provide broad bounds for acquisition projects. Within these bounds, the projects would use best practices of industry, academia, and government to provide efficient solutions to materiel needs (Kaminski, Coyle and Paige 1996; DoD 1998). Mintzberg and Waters (1985) refer to this type of strategy as an "Umbrella Strategy." This overall strategy is partly deliberate and partly emergent in nature. In DoD's case, the deliberate strategy is provided by DoD 5000.2R, which imposes bounds on PM action. The emergent strategy is formed by a pattern of innovative actions which are taken by PMs executing their projects.

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b)   ***DoD Actual Strategy***

The strategy observed from the Functional Database is one of confusing, detailed processes articulated by the central leadership, DoD, and backed up by formal controls to ensure implementation. While an intended strategy drives goals and actions, the result of those actions and any obtained goals are the actual strategy. Thus the actual strategy can be much different than the one intended (Mintzberg 1996, 10).

(1)   Analysis Driven.   Approximately one third of all requirements in the Functional Database are for analysis and synthesis. This indicates the DoD's strategy relies on PMs performing a large amount of analysis to guide decisions such as the synthesis of alternatives and milestone approvals. But no guides or processes are defined for performing this analysis.

(2)   Strategic Planning vs. Strategic Thinking.   The large number of standard analyses and processes required by DoD 5000.2R promote confusion over strategic thinking or planning. There is, however, a common mistake in expecting innovative managers to use the same models as those defined in this analysis. Mintzberg (1996) observes that the essence of strategic thinking is thinking "outside the box." This "box" is the set of models defined by standard analyses. Models are key to planning action.   Strategic thinking, however, requires using new models and old ones in new ways. DoD requires many standard models be used by PMs. These standard models control analyses, from how they construct Work Breakdown Structures to what alternative solutions they consider (DoD 1998). This structured approach restricts the PM's ability to employ strategic thinking. Tailoring allows movement back to strategic

thinking for those PMs with resources and time to tailor the immense Functional Database.

(3)   Trends in DoD.   Increased constraints are evident by the fact that no requirements were removed by Change 3, while a number were added (DoD 1998). Change 3 indicates that the number of constraints on the DoD acquisition process is creeping UPWARD.

(4)   Planned Strategy.   While an Umbrella Strategy is intended by DoD, this regulation imposes more of a Planned Strategy on PMs. Mintzberg (1996) defines a Planned Strategy as one where precise intentions are formulated and articulated by a central leadership. Actions of subordinates are reviewed by formal controls to ensure surprise-free execution. Such a strategy is suited for benign, controllable, or predictable environments. This planned strategy is nearly all deliberate, with little room for emergent strategy by subordinates. Current DoD leadership stresses the need for reform of acquisition, with strategies determined at the DoD level (Gansler 1998, 12). This is further indication that DoD is pursuing a Planned Strategy. Thus we have conflict between what DoD policy makers say and what they do in DoD 5000.2R.

D.   CHAPTER SUMMARY

A quantitative and qualitative analysis of the Functional Database was conducted. The quantitative analysis used a Pareto analysis of requirement count, by category. This allowed determination of DoD's emphasis on mandatory functions. From a quantitative perspective, DoD is emphasizing control over synthesis portions of each acquisition phase. This control is primarily directed at design of the acquisition process and the

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system alternative sources. Qualitative analysis was performed on DoD 5000.2R and the Functional Database from two perspectives. The first was as a communication tool to identify characteristics of DoD's intentions. The second was a complementary examination of the implied strategy DoD is pursuing for acquisition.

Qualitative analysis indicates that DoD is sending mixed signals with this regulation. On one hand, the complex nature of the mandatory acquisition process demands highly competent technical managers as an audience. On the other hand, the large number of constraints imposed by DoD indicate a concern that acquisition managers are inexperienced and need "spoon feeding."

V. CONCLUSION AND RECOMMENDATION

A. CONCLUSIONS AND ANSWERS TO RESEARCH QUESTIONS

1. Primary Question

To what extent does the DoD 5000.2R constrain the project manager?

DoD 5000.2R "Mandatory Procedures for Major Defense Acquisition Programs (MDAPs) and Major Automated Information System (MAIS) Acquisition Programs" is a complex regulation with a very large number of constraints on project managers. The recent Change 3 to DoD 5000.2R shows a trend of increasing that level of constraint.

The level of detail within DoD 5000.2R constraints is mixed. While not an extremely detailed document, the regulation is over-constraining for an experienced technical manager, too complex for someone below that level of expertise, and too conceptual for the direction of inexperienced novices. Borrowing from parts of several established processes, this regulation provides an inadequate level of process detail to allow prudent tailoring.

2. Subsidiary Questions

a) *DoD 5000.2R Project Management Requirements*

What are the requirements included in the 5000.2R that affect defense acquisition project management?

There are 862 specific requirements on the acquisition program covering the entire system life cycle. These requirements are listed in Appendix A.

b)   DoD 5000.2R Project Management Process

What common functions are required to be performed by project management?

What requirements must these functions meet?

When repeated as required during phases of development, the identified requirements impose 3,040 individual constrained functions. The majority of these constrained functions are to be accomplished during development.

c)   Quantitative Analysis of Findings

What are the quantities and distribution of requirements among project management functions?

Pareto analysis reveals a primary focus of DoD 5000.2R requirements is the direction or influence on both system solutions and the development process used by the PM.

d)   Qualitative Analysis of Findings

How effective is DoD 5000.2R as a communication tool?

A variety of other media is available to assist understanding defense acquisition. However, no other document or media is allowed to supplement DoD 5000.2R. This mandate makes reliance on other sources unofficial and at the sole risk of the PM. As a stand alone document, it is too lean a form of media for the complex

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message it contains. Additionally, it is poorly written as a requirements document, a defect which ensures omissions and misinterpretations of the intended system solution and development process. A strategic contingency model for government communications rates this document as a "Communication Failure" as a stand alone regulation.

What implications on DoD acquisition policy can be obtained from this document?

Because the document focuses on constraining system solutions and development process, it raises concern that DoD does not view project managers as competent and capable of managing acquisitions. This may explain DoD's acquisition policy movement from an umbrella strategy (stated in acquisition reform as leaving details to the PM) to one that is planned and executed by an increasingly autocratic management style. By mandating good practices, DoD 5000.2R is preventing the use of best practices. Best practices are fluid, growing in number and are unique to each acquisition domain.

B. RECOMMENDATIONS

1. Determine the Primary Audience for DoD 5000.2R

If competent project personnel are the audience, then this regulation should be focused on policy, greatly reduced in detail. If the view of project office personnel is one of incompetence, then go further than DoD I 5000.2 and provide a step-by-step cookbook with thousands of clear requirements. A particular audience must be established before

this document will successfully elicit behavior from its project personnel. Otherwise, personnel will either be over-constrained or given too little guidance.

2.   Hire Program Managers in Whom DoD is Confident

The evident lack of confidence in current Program and Project Managers has only one clear solution. It is true that DAWIA will provide some of the education required for competent management and systems engineering.   However, PM positions must be seriously viewed as critical by DoD. The implication of this includes much that is true for industry key positions, compensation, office location, and career advancement conducive to attracting talented technical managers.   Current relative aspects of Government PM positions -- high stress, low pay, undesireable locations and no clear career path -- will seldom attract and keep talented, technically competent managers.

3.   Assign One Organization Authority for Editing the Contents of DoD 5000.2R

The complex sentence structure and implied requirements should be screened out by one organization under the Office of the Secretary of Defense. That one organization should be manned by systems engineers competent in writing and managing requirements. This organization should also be held responsible by the acquisition organization for clarification of DoD regulation content on a continuing basis as a service. Clarifications should carry the same weight as the regulation.

4.   Rewrite DoD 5000.2R as a Performance Document (One Requirement per Sentence)

Assuming a competent acquisition organization, DoD 5000.2R should describe what is required, not how to achieve it. The issue of competence of DoD personnel

responding to this regulation should be the same as contractor personnel responding to a specification. Through specifications, contractors are told only the result to be achieved, not how to achieve that result. With comparable competence, DoD acquisition personnel should be given a similar scope of direction.

Follow best practices in rewriting DoD 5000.2R to allow understanding. Use personnel competent in communicating requirements such as systems engineers to manage the rewrite. The use of standard templates for mandatory statements, simple, consistent and concise language, diagrams and figures, decision tables and charts, and the inclusion of metrics in these acquisition requirements are required for acquisition personnel to understand what is required of them.

C. RECOMMENDATIONS FOR FURTHER STUDY

1. Comparison of DoD 5000.2R Requirements Baseline with a DoDI 5000.2 Requirements Baseline

Perform requirements analysis and functional analysis of DoDI 5000.2 and compare with these thesis results. Comparisons would be valuable in the number of requirements, the distribution of requirements over the life cycle, and implied management philosophies. These comparisons would provide indications of trends or latent requirements in the migration to current acquisition reform regulations.

2. Project Office Response to DoD 5000.2R

Poll project offices for response to this thesis and obtain whether they are accounting for accomplishment of the large number of requirements. If so, the methods

they are using should be examined. The information would provide cost data for evaluation of the cost imposed on project offices by this regulation. If they are not taking these requirements into consideration, the percentage of unofficial tailoring and tailoring without analysis can be deduced.

3. DAWIA Status

Poll higher DoD officials on their opinion of the competency of acquisition personnel, especially PMs. A comparison of the answer with trends in DAWIA training status, number of personnel per year and number of hours per person, would provide a test for DAWIA alignment with DoD management policy.

4. Rewrite of DoD 5000.2R

Apply the recommendations of this thesis (especially the Requirements Baseline in Appendix A) to rewrite DoD 5000.2R. This resulting document would conform to acceptable communication and requirement documentation standards. Additionally, provide recommendations for proposed adjustments to constraints imposed by public law.

5. Acquisition Measures of Effectiveness

Identify applicable measures of effectiveness for use in DoD 5000.2R. These measures should allow high level military and civilian officials to determine the status of an acquisition program from perspectives implied in the current DoD 5000.2R Change 3.

APPENDIX. REQUIREMENTS DATABASE FROM DOD 5000.2R

Notes:
1. This listing is sorted by section of DoD 5000.2R.
2. Requirements numbers in this Appendix were assigned during initial identification of requirements. Later combination of like requirements cause those numbers to repeat with omission of the original requirement number. Additionally a few derived requirements were deleted after re-evaluation leaving gaps in the requirements number sequence.

Applicable DoD 5000.2R Statements

Extracted Requirements

Memo	Statement	No.	Subject	Task	Object	Modifier	Using
Memo	The MDA shall approve proposed tailoring.	001	MDA	approve	process tailoring		
1.1 Purpose	However, cognizant of this model, the Program Manager (PM) and the Milestone Decision Authority (MDA) shall structure the MDAP or MAIS to ensure a logical progression through a series of phases designed to reduce risk, ensure affordability, and provide adequate information for decision-making that will provide the needed capability to the warfighter in the shortest practical time.	002	Both	structure	process	through a series of phases	
	PMs and MDAs for other than MDAPs or MAISs shall generally adhere to the process described in this part; however, they shall tailor the process, as appropriate, to best match the conditions of individual non-major programs.	003	Both	adhere	process	generally, other than MDAPs	
		004	Both	tailor	process		
1.2 Overview of the Acquisition Management Process	The acquisition process shall be structured in logical phases separated by major decision points called milestones.	005	Both	structure	process	in logical phases	
		006	Both	structure	process	phases separated by major decision points	
	The process shall begin with the identification of broadly stated mission needs that cannot be satisfied by nonmateriel solutions.	007	Both	structure	process	begin with broadly stated mission needs	

Applicable DoD 5000.2R Statements

1.2 Overview of the Acquisition Management Process

Threat projections, system performance, unit production cost estimates, life cycle costs, interoperability, cost-performance-schedule trade-offs, acquisition strategy, affordability constraints, and risk management shall be major considerations at each milestone decision point, including the decision to start a new program.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
008	Both	consider	Threat projections	at each milestone decision point	
009	Both	consider	system performance	at each milestone decision point	
010	Both	consider	unit production cost estimates	at each milestone decision point	
011	Both	consider	life cycle costs	at each milestone decision point	
012	Both	consider	interoperability	at each milestone decision point	
013	Both	consider	cost-performance-schedule	at each milestone decision point	
014	Both	consider	acquisition strategy	at each milestone decision point	
015	Both	consider	affordability constraints	at each milestone decision point	
016	Both	consider	risk management	at each milestone decision point	

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Applicable DoD 5000.2R Statements

1.2 Overview of the Acquisition Management Process

At program initiation, and after consideration of the views of the Working-Level Integrated Product Team (IPT) and Overarching IPT members, the PM shall propose, and the MDA shall consider for approval, the appropriate milestones, the level of decision for each milestone, and the documentation needed for each milestone.

This proposal shall consider the size, complexity, and risk of the program.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
017	PM	consider	views of the Working-Level Integrated Product Team (IPT)	At program initiation	
018	PM	consider	views of Overarching IPT members	At program initiation	
019	PM	propose	appropriate milestones	At program initiation	
020	PM	propose	level of decision for each milestone	At program initiation	
021	PM	propose	documentation needed for each milestone	At program initiation	
022	MDA	consider for approval	documentation needed for each milestone	At program initiation	
023	PM	consider	size of the program	proposal	
024	PM	consider	complexity of the program	proposal	

Applicable DoD 5000.2R Statements

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
025	PM	consider	risk of the program	proposal	
026	Both	reexamine	determinations		
027	Both	categorize	project	based on ACAT	
028	PM	accomplish	process	core activities	
029	Both	tailor	process	minimize time	
030	Both	tailor	process	IAW statutes	
031	Both	tailor	process	based on program's category status	

1.2 Overview of the Acquisition Management Process

This proposal shall consider the size, complexity, and risk of the program.

The determinations made at program initiation shall be reexamined at each milestone in light of then-current program conditions.

1.3 Categories of Acquisition Programs and Milestone Decision Authorities

Upon initiation, size and complexity shall generally categorize acquisition programs. The categories are: ACAT I, ACAT IA, ACAT II, ACAT III

1.4 Acquisition Phases & Accomplishments

All programs, including highly sensitive classified, cryptologic, and intelligence programs, shall accomplish certain core activities described throughout this Regulation. How these activities are conducted shall be tailored to minimize the time it takes to satisfy an identified need consistent with common sense and sound business practice.

Tailoring shall give full consideration to applicable statutes.

The number of phases and decision points shall be tailored to meet the specific needs of individual PMs, based on objective assessments of a program's category status, risks, the adequacy of proposed risk management plans, and the urgency of the user's need.

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Applicable DoD 5000.2R Statements

Extracted Requirements

	Statement	No.	Subject	Task	Object	Modifier	Using
1.4 Acquisition Phases & Accomplishments	The number of phases and decision points shall be tailored to meet the specific needs of individual PMs, based on objective assessments of a program's category status, risks, the adequacy of proposed risk management plans, and the urgency of the user's need.	032	Both	tailor	process	risks	Using
		033	Both	assess	process	adequacy of proposed risk management plans	
		034	Both	assess	process	urgency of the user's need	
	Tailored acquisition strategies may vary the way in which core activities are to be conducted, the formality of reviews and documentation, and the need for other supporting activities. ACAT II and III program managers shall work with their decision authorities to tailor any documentation and decision points to the needs of the individual program.	004	Both	tailor	process		
1.4.2 Phase 0: Concept Exploration	Analysis of alternatives shall be used as appropriate to facilitate comparisons of alternative concepts. The most promising system concepts shall be defined in terms of initial, broad objectives for cost, schedule, performance, software requirements, opportunities for tradeoffs, overall acquisition strategy, and test and evaluation strategy.	036	Both	use	analysis of alternatives	as appropriate	
		037	PM	analyze	cost	as appropriate	analysis of alternatives
		038	PM	analyze	schedule	as appropriate	analysis of alternatives

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Applicable DoD 5000.2R Statements

Extracted Requirements

DoD 5000.2R Statement Section	Statement	No.	Subject	Task	Object	Modifier	Using
1.4.2 Phase 0: Concept Exploration	Analysis of alternatives shall be used as appropriate to facilitate comparisons of alternative concepts. The most promising system concepts shall be defined in terms of initial, broad objectives for cost, schedule, performance, software requirements, opportunities for tradeoffs, overall acquisition strategy, and test and evaluation strategy.	039	PM	analyze	performance	as appropriate	analysis of alternatives
		040	PM	analyze	software requirements	as appropriate	analysis of alternatives
		041	PM	analyze	opportunities for tradeoffs	as appropriate	analysis of alternatives
		042	PM	analyze	overall acquisition strategy	as appropriate	analysis of alternatives
		043	PM	analyze	test and evaluation strategy	as appropriate	analysis of alternatives
1.4.3 Phase I: Program Definition and Risk Reduction	During this phase, the program shall become defined as one or more concepts, design approaches, and/or parallel technologies are pursued as warranted.	044	PM	define	concept(s)		
1.4.4.1 Low Rate Initial Production	LRIP quantities for all ACATs shall be minimized.	056	Both	plan	LRIP quantities	minimize quantity	
	The LRIP quantity (with rationale for quantities exceeding 10% of the total production quantity documented in the acquisition strategy) shall be included in the first SAR after its determination.	057	Both	plan	LRIP quantities	in first SAR with rationale if over 10% total production	SAR

Applicable DoD 5000.2R Statements

Extracted Requirements

Statement section	DoD 5000.2R Statement	No.	Subject	Task	Object	Modifier	Using
1.4.4.1 Low Rate Initial Production	The LRIP quantity (with rationale for quantities exceeding 10% of the total production quantity documented in the acquisition strategy) shall be included in the first SAR after its determination.	058	Both	plan	LRIP quantities	<= 10% total production	SAR
1.4.5 Phase III: Production, Fielding/Deploymen t, and Operational Support	Deficiencies encountered in Developmental Test and Evaluation (DT&E) and Initial Operational Test and Evaluation (IOT&E) shall be resolved and fixes verified.	062	PM	resolve	deficiencies	encountered in DT&E/IOT&E	
		063	PM	verify	deficiencies	are fixed	
1.4.5.1 Operational Support	A follow-on operational testing program that assesses performance and quality, compatibility, and interoperability, and identifies deficiencies shall be conducted, as appropriate.	064	PM	conduct	follow-on operational test program		
		065	PM	assess	performance	as appropriate	follow-on operational test program
		066	PM	assess	quality	as appropriate	follow-on operational test program
		067	PM	assess	compatibility	as appropriate	follow-on operational test program

Applicable DoD 5000.2R Statements

Extracted Requirements

		No.	Subject	Task	Object	Modifier	Using
1.4.5.1 Operational Support	A follow-on operational testing program that assesses performance and quality, compatibility, and interoperability, and identifies deficiencies shall be conducted, as appropriate.	068	PM	assess	interoperability	as appropriate	follow-on operational test program
		069	PM	identify	deficiencies	as appropriate	follow-on operational test program
1.4.5.2 Modifications	Any modification that is of sufficient cost and complexity that it could itself qualify as an ACAT I or ACAT IA program shall be considered for management purposes as a separate acquisition effort.	072	MDA	structure	modification	as separate acquisition effort if ACAT I or ACAT IA	
1.4.6 Demilitarization and Disposal	During demilitarization and disposal, the PM shall ensure material determined to require demilitarization is controlled and shall ensure disposal is carried out in a way that minimizes DoD's liability due to environmental, safety, security, and health issues.	073	PM	control	demil material		
		074	PM	execute	disposal	minimize DOD environmental liability	
		075	PM	execute	disposal	minimize DOD safety liability	
		076	PM	execute	disposal	minimize DOD security liability	
		077	PM	execute	disposal	minimize DOD health issues liability	

Applicable DoD 5000.2R Statements

1.5 Milestone Decision Points

The MDA shall establish tailored milestone decision points for each acquisition program as early as possible in the program life cycle.

At each milestone or program review, the MDA shall determine that the program being reviewed is progressing satisfactorily and is still required under the current DoD Strategic Plan

1.5.2 Milestone I: Approval to Begin a New Acquisition Program

Acquisition strategy;

Acquisition Program Baseline (APB) (10 USC 2435 , for ACAT I), including Cost as an Independent Variable (CAIV)-based objectives, and,

Phase I exit criteria.

1.5.3 Milestone II: Approval to Enter Engineering and Manufacturing Development

The LRIP strategy and decision authority shall be considered at this milestone.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
078	MDA	tailor	milestone decision points	as early as possible	
079	MDA	determine	project	progressing satisfactorily	
080	MDA	determine	project	still required	DOD Strategic Plan
081	MDA	approve	acquisition strategy		
082	MDA	approve	APB		
083	MDA	approve	CAIV-based objectives		APB
084	MDA	approve	Phase I exit criteria		
085	MDA	consider	LRIP strategy		

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Applicable DoD 5000.2R Statements

1.5.3 Milestone II: Approval to Enter Engineering and Manufacturing Development

Acquisition strategy;

APB (10 USC 2435, for ACAT I), including CAIV-based objectives;

Phase II exit criteria;

LRIP quantities (10 USC 2400)*; and

Waiver from full-up, system-level LFT&E, if applicable (10 USC 2366).

1.5.4 Milestone III: Production or Fielding/Deployment Approval

At this milestone, the MDA shall approve the following:

Acquisition strategy,

APB (10 USC 2435, for ACAT I), including CAIV-based objectives,

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
081	MDA	approve	acquisition strategy		
082	MDA	approve	APB		APB
088	MDA	approve	CAIV-based objectives		
089	MDA	approve	Phase II exit criteria		
090	MDA	approve	LRIP quantities		
091	MDA	approve	waiver from full-up, system-level LFT&E	as appropriate	
092	MDA	approve			
081	MDA	approve	acquisition strategy		
082	MDA	approve	APB		

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Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
1.5.4 Milestone III: Production or Fielding/Deployment Approval — APB (10 USC 2435, for ACAT I), including CAIV-based objectives,	095	MDA	approve	CAIV-based objectives	as appropriate	APB
Phase III exit criteria, if appropriate, and	096	MDA	approve	Phase III exit criteria	as appropriate	
Provisions for evaluation of post-deployment performance (GPRA; CCA; and PRA).	097	MDA	approve	provisions for eval of post-deployment performance	GPRA, CCA, PRA	
1.6 Integrated Product Teams — The Secretary of Defense has directed that the Department perform as many acquisition functions as possible, including oversight and review, using IPTs. These IPTs shall function in a spirit of teamwork with participants empowered and authorized, to the maximum extent possible, to make commitments for the organization or the functional area they represent.	098	Both	execute	project	maximum extent possible	IPTs
When IPTs include representatives from organizations other than the federal government, PMs shall comply with the Federal Advisory Committee Act (FACA).	099	PM	execute	project	IAW FACA	IPTs
In addition, PMs shall also remember that the participation of a contractor or a prospective contractor on a IPT shall be in accordance with other statutory requirements, such as procurement integrity rules.	100	PM	execute	project	IAW procurement integrity rules	IPTs
	101	PM	execute	project	IAW statutory requirements	IPTs

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Applicable DoD 5000.2R Statements

Extracted Requirements

	Statement	No.	Subject	Task	Object	Modifier	Using
1.6 Integrated Product Teams	Prospective contractor involvement on IPTs shall be reviewed by the Component's legal advisor.	102	PM	consider	legal advice	when prospective involvement of contractor on IPTs	Component's legal advisor
2.2 Intelligence Support	When acquisition programs are initiated in response to a military threat, they shall be based on authoritative, current, and projected threat information.	103	PM	execute	project	when in response to military threat	authoritative threat information
		104	PM	execute	project	when in response to military threat	current threat information
		105	PM	execute	project	when in response to military threat	projected threat information
	Early and continued collaboration among the intelligence, requirements generation, and acquisition management communities shall be maintained to ensure the timely availability of validated threat information. This collaboration shall include joint examination of critical intelligence categories that could significantly influence the effective operation of the deployed system.	106	PM	consider	intelligence community		joint examination of critical intelligence categories
		107	PM	consider	requirements generation community		joint examination of critical intelligence categories
		108	PM	consider	acquisition management community		joint examination of critical intelligence categories

Applicable DoD 5000.2R Statements

Extracted Requirements

Statement		No.	Subject	Task	Object	Modifier	Using
2.2 Intelligence Support	Initial system threat assessments shall be prepared by DoD Components to support program initiation usually at Milestone I, Approval to Begin a New Acquisition Program, and maintained in a current and approved or validated status throughout the acquisition process.	109	PM	assess	threat		
		110	PM	update	threat		threat assessment
	They shall be system-specific to the degree of system definition at the time the assessment is made and address the projected threat at IOC and IOC plus ten years.	111	PM	assess	threat	at IOC and IOC plus ten years	threat assessment
Evaluation of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Support	A C4I support plan shall be prepared for all weapons systems/programs that interface with C4I systems. The C4I Support Plan shall include a system description, employment concept (including targeting, battle damage assessment, and bomb impact assessment requirements), operational support requirements (including C4I, testing, and training), interoperability and connectivity characteristics, management, and scheduling concerns.	112	PM	plan	C4I		C4I Support Plan
		113	PM	describe	system		C4I Support Plan
		114	PM	describe	employment concept		C4I Support Plan
		115	PM	describe	targeting requirements		C4I Support Plan

Applicable DoD 5000.2R Statements

Evaluation of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Support	A C4I support plan shall be prepared for all weapons systems/programs that interface with C4I systems. The C4I Support Plan shall include a system description, employment concept (including targeting, battle damage assessment, and bomb impact assessment requirements), operational support requirements (including C4I, testing, and training), interoperability and connectivity characteristics, management, and scheduling concerns.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
116	PM	describe	battle damage assessment requirements		C4I Support Plan
117	PM	describe	bomb impact assessment requirements		C4I Support Plan
118	PM	describe	operational support		C4I Support Plan
119	PM	describe	C4I testing		C4I Support Plan
120	PM	describe	C4I training		C4I Support Plan
121	PM	describe	interoperability		C4I Support Plan
122	PM	describe	connectivity characteristics		C4I Support Plan
123	PM	describe	management concerns		C4I Support Plan

Applicable DoD 5000.2R Statements

Evaluation of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Support

A C4I support plan shall be prepared for all weapons systems/programs that interface with C4I systems. The C4I Support Plan shall include a system description, employment concept (including targeting, battle damage assessment, and bomb impact assessment requirements), operational support requirements (including C4I, testing, and training), interoperability and connectivity characteristics, management, and scheduling concerns.

An evaluation of compatibility, interoperability, integration, and intelligence support for targeting requirements shall be accomplished for all weapons, systems/programs noted above (see CJCSI 3170.01 and CJCSI 6212.01A).

In accordance with CJCSI 3170.01, C4ISR requirements shall be reviewed and updated, as necessary, at every milestone decision and whenever the concept of operations or intelligence requirements change.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
124	PM	describe	scheduling concerns		C4I Support Plan
125	PM	evaluate	compatibility		
126	PM	evaluate	interoperability		
127	PM	evaluate	integration support		
128	PM	evaluate	intelligence support for targeting requirements		
129	PM	update	C4ISR requirements	as necessary	
130	PM	update	C4ISR requirements	concept of operations change	

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Evaluation of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) Support

In accordance with CJCSI 3170.01 , C4ISR requirements shall be reviewed and updated, as necessary, at every milestone decision and whenever the concept of operations or intelligence requirements change.

2.3 Requirements Evolution

System performance objectives and thresholds shall be developed from, and remain consistent with, the initial broad statements of operational capability.

The requirements shall be refined at successive milestone decision points, as a consequence of cost as an independent variable (CAIV)-based cost-schedule-performance trade-offs during each phase of the acquisition process.

In the process of refining requirements, key concepts that shall be adhered to include:

keeping all reasonable options open and facilitating trade-offs throughout the acquisition process;

avoiding early commitments to system-specific solutions, including those that inhibit future insertion of new technology and commercial or non-developmental items;

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
131	PM	update	C4ISR requirements	intelligence requirements change	
132	PM	develop	performance objectives and thresholds	consistent with initial statements of operational capability	
133	Both	refine	requirements		CAIV-based cost-schedule -performance trade-offs
134					
135	Both	refine	requirements	keeping all reasonable options open	
136	Both	refine	requirements	facilitating trade-offs	
137	Both	refine	requirements	avoiding early commitments to system specific solutions	

Applicable DoD 5000.2R Statements

2.3 Requirements Evolution

avoiding early commitments to system-specific solutions, including those that inhibit future insertion of new technology and commercial or non-developmental items;

defining requirements in broad operational capability terms; and

using minimum acceptable operational performance (thresholds) to establish operational test criteria.

At each milestone beginning with program initiation (usually Milestone I), thresholds and objectives initially expressed as measures of effectiveness or performance and minimum acceptable requirements for the proposed concept or system shall be documented by the user or user's representative in an Operational Requirements Document (ORD) (see Appendix II).

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
138	Both	refine	requirements	avoiding early commitments to solutions that inhibit future insertion of new technology	
139	Both	refine	requirements	avoiding early commitments to solutions that inhibit future insertion of commercial items	
140	Both	refine	requirements	avoiding early commitments to solutions that inhibit future insertion of NDI items	
141	Both	refine	requirements	in broad operational capability terms	
142	Both	refine	requirements	thresholds establish operational test criteria	
143	User	document	requirements	in terms of MOEs or threshold and objectives	ORD

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Extracted Requirements

2.3 Requirements Evolution

Thresholds and objectives in the ORD shall be CAIV-based, considering the results of the analysis of alternatives and the impact of affordability constraints.

Key Performance Parameters (KPPs), validated by the JROC or cognizant Principal Staff Assistant (PSA), shall be included in the appropriate Acquisition Program Baseline (APB) (see 3.2.2). A KPP is that capability or characteristic so significant that failure to meet the threshold can be cause for the concept or system selection to be reevaluated or the program to be reassessed or terminated. KPPs are extracted from the ORD and included in the APB.

In addition, the user or user's representative shall work with the Program Manager or other system developer to establish, at program initiation, and refine, at subsequent milestones, CAIV-based cost and performance objectives and critical schedule dates.

No.	Subject	Task	Object	Modifier	Using
144	User	document	requirements	CAIV-based requirements	ORD
145	User	document	requirements	considering analysis of alternatives	ORD
146	User	document	requirements	considering affordability constraints	ORD
147	PM	document	KPPs	KPPs validated	APB
148	User	establish	CAIV-based objectives	with PM	
149	User	establish	critical schedule dates	with PM	

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2.3.1 Evaluation of Requirements Based on Commercial Market Potential In developing system performance requirements, DoD Components shall evaluate how the desired performance requirements could reasonably be modified to facilitate the use of potential commercial or non-developmental items, components, specifications, open standards, processes, technology, and sources (10 USC 2377 ; CCA).

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
150	PM	evaluate	requirements	for use of commercial items	
151	PM	evaluate	requirements	for use of commercial components	
152	PM	evaluate	requirements	for use of commercial specifications	
153	PM	evaluate	requirements	for use of NDI items	
154	PM	evaluate	requirements	for use of NDI components	
155	PM	evaluate	requirements	for use of NDI specifications	
156	PM	evaluate	requirements	for use of open standards	
157	PM	evaluate	requirements	for use of open processes	
158	PM	evaluate	requirements	for use of open technology	

Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
2.3.1 Evaluation of Requirements Based on Commercial Market Potential — In developing system performance requirements, DoD Components shall evaluate how the desired performance requirements could reasonably be modified to facilitate the use of potential commercial or non-developmental items, components, specifications, open standards, processes, technology, and sources (10 USC 2377 ; CCA).	159	PM	evaluate	requirements	for use of open sources	Using
The results of the evaluation shall be included as part of the initial ORD.	160	User	document	results of evaluation	evaluation of requirements based on commercial market potential	ORD
2.4 Analysis of Alternatives — An analysis of alternatives is part of the CAIV process and shall be prepared and considered at appropriate milestone decision reviews of ACAT I programs, beginning with program initiation (usually Milestone I).	161	PM	analyze	project		analysis of alternatives
There shall be a clear linkage between the analysis of alternatives, system requirements, and system evaluation measures of effectiveness (CCA and PRA).	162	PM	analyze	project	consistency among analysis of alternatives, system requirements, and MOE's	
2.5 Affordability — Components shall plan programs consistent with the DoD Strategic Plan, and based on realistic projections of likely funding available in the Future Years Defense Program (FYDP) and in years beyond the FYDP.	163	Both	plan	project		DOD Strategic Plan
	164	Both	plan	project	based on likely funding FYDP and beyond	FYDP

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Applicable DoD 5000.2R Statements

2.5 Affordability — Affordability shall be assessed at each milestone decision point beginning with program initiation (usually Milestone I).

No acquisition program shall be approved to proceed beyond program initiation unless sufficient resources, including manpower, are programmed in the most recently approved FYDP, or will be programmed in the next Program Objective Memorandum (POM), Budget Estimate Submission (BES), or President's Budget (PB) (CCA and OMB Circular A-11).

2.6 Supportability — support requirements are not to be stated as distinct logistics elements, but instead as performance requirements that relate to a system's operational effectiveness, operational suitability, and life cycle cost reduction (CCA and PRA).

3.2 Program Goals — Every acquisition program shall establish program goals for the minimum number of cost, schedule, and performance parameters that describe the program.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
165	Both	assess	affordability		
166	Both	determine	resources	are approved	FYDP
167	Both	determine	resources	are approved	Budget Estimate Submission
168	Both	determine	resources	are approved	POM
169	Both	determine	resources	are approved	President's Budget
170	PM	define	support requirements	in terms of performance requirements	
171	PM	establish	cost goals	to describe program	
172	PM	establish	schedule goals	to describe program	

Applicable DoD 5000.2R Statements

3.2 Program Goals — Every acquisition program shall establish program goals for the minimum number of cost, schedule, and performance parameters that describe the program.

Program goals shall be linked to the DoD Strategic Plan and other appropriate subordinate strategic plans, such as Component and functional strategic plans, and to the Strategic Information Resources Management Plan required by the Paperwork Reduction Act of 1995. These program goals shall be identified as objectives and thresholds.

3.2.1 Objectives and Thresholds — If the threshold values are not otherwise specified, the threshold value for performance shall be the same as the objective value, the threshold value for schedule shall be the objective value plus six months for ACAT I and three months for ACAT IA,

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
173	PM	establish	performance goals	to describe program	
174	PM	establish	goals	as objectives and thresholds so that they are linked to higher level plans	DOD Strategic Plan
175	PM	establish	goals	as objectives and thresholds so that they are linked to higher level plans	Component strategic
176	PM	establish	goals	as objectives and thresholds so that they are linked to higher level plans	functional strategic
177	PM	establish	goals	as objectives and thresholds so that they are linked to higher level plans	Strategic Information Resources Management Plan
178	PM	establish	threshold	same as objective if not stated differently	

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
3.2.1 Objectives and Thresholds					
If the threshold values are not otherwise specified, the threshold value for performance shall be the same as the objective value, the threshold value for schedule shall be the objective value plus six months for ACAT I and three months for ACAT IA,					
179	PM	establish	threshold schedule	as objective plus 6 months (3 mos ACAT IA)	
If the threshold values are not otherwise specified,... the threshold value for cost shall be the objective value plus 10 percent.					
180	PM	establish	threshold cost	as objective plus 10 % (unless otherwise specified)	
Trade-offs outside the trade space (i.e., program parameter changes) may be considered; however, trade-offs outside the trade space shall not be made without the approval of the MDA and ORD approving authority					
181	PM	obtain	approval for trade-offs	outside of established trade space	MDA, ORD approving authority
In addition, key performance parameters validated by the JROC or by a PSA may not be traded-off without JROC approval or PSA review.					
182	PM	obtain	approval for trade-offs	outside of JROC established trade space	JROC
3.2.2 Acquisition Program Baselines					
Every acquisition program shall establish an Acquisition Program Baseline (APB) to document the cost, schedule, and performance objectives and thresholds of that program beginning at program initiation.					
183	PM	document	cost goals		APB
184	PM	document	schedule goals		APB
185	PM	document	performance goals		APB
Performance shall include supportability and, as applicable, environmental requirements.					
186	PM	document	supportability goals		APB

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Extracted Requirements

		No.	Subject	Task	Object	Modifier	Using
3.2.2 Acquisition Program Baselines	Performance shall include supportability and, as applicable, environmental requirements.	187	PM	document	environmental goals		APB
	The format for the APB is included in the Consolidated Acquisition Reporting System (CARS) (see Appendix I)	188	PM	document	goals	for the APB	Consolidated Acquisition Reporting System (CARS)
3.2.2.1 Preparation and Approval	The PM, in coordination with the user, shall prepare the APB at program initiation for ACAT I and ACAT IA programs, at each subsequent major milestone decision, and following a program restructure or an unrecoverable program deviation.	189	PM	prepares	APB	beginning at initiation	
	The Program Executive Officer (PEO) and the Component Acquisition Executive (CAE), as appropriate, shall concur in the APB. The MDA shall approve the APB.	082	MDA	approve	APB		
	For ACAT I and ACAT IA programs, the MDA shall not approve the APB without the coordination of the Under Secretary of Defense (Comptroller) (10 USC 2220(a)(2)) and the Joint Requirements Oversight Council (JROC) or, in the case of ACAT IA programs, the Principal Staff Assistant (PSA) in place of the JROC (where applicable).	191	MDA	coordinate with	USD (Comptroller)	prior to approval for ACAT I/IA	APB
		192	MDA	coordinate with	JROC	prior to approval for ACAT I/IA	APB

Applicable DoD 5000.2R Statements

Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
3.2.2.1 Preparation and Approval	No funds shall be obligated for an ACAT I program after that program enters engineering and manufacturing development or production and deployment until an APB has been approved by the MDA, unless the USD(A&T) has specifically approved the obligation, in accordance with 10 USC 2435(b) .	193	MDA	approve	APB	prior to obligation of funds for ACAT I EMD, production and deployment	
3.2.3 Exit Criteria	MDAs shall use exit criteria to establish goals for ACAT I (10 USC 2220(a)(1)) and ACAT IA (CCA) programs during an acquisition phase. The MDA shall approve the exit criteria.	194	MDA	approve	project goals		exit criteria
	At each milestone review, the PM shall propose exit criteria appropriate to the next phase of the program.	195	PM	propose	project goals		exit criteria
	The exit criteria shall serve as gates that, when successfully passed or exited, demonstrate that the program is on track to achieve its final program goals and should be allowed to continue with additional activities within an acquisition phase or be considered for continuation into the next acquisition phase.	196	Both	use	quality gates		exit criteria
3.3 Acquisition Strategy	Each PM shall develop and document an acquisition strategy that shall serve as the roadmap for program execution from program initiation through post-production support.	197	PM	develop	process		acquisition strategy
	A primary goal in developing an acquisition strategy shall be to minimize the time and cost of satisfying an identified, validated need, consistent with common sense and sound business practices.	198	PM	develop	process	minimize cost and schedule	acquisition strategy

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3.3 Acquisition Strategy

The acquisition strategy shall evolve through an iterative process and become increasingly more definitive in describing the relationship of the essential elements of a program.

Essential elements in this context include, but are not limited to, open systems, sources, risk management, cost as an independent variable, contract approach, management approach, environmental considerations, and source of support.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
199	PM	refine	process		acquisition strategy
200	PM	document	process open systems		acquisition strategy
201	PM	document	process sources		acquisition strategy
202	PM	document	process risk management		acquisition strategy
203	PM	document	process CAIV		acquisition strategy
204	PM	document	process contract approach		acquisition strategy
205	PM	document	process management approach		acquisition strategy
206	PM	document	process environmental considerations		acquisition strategy

Applicable DoD 5000.2R Statements

3.3 Acquisition Strategy

Essential elements in this context include, but are not limited to, open systems, sources, risk management, cost as an independent variable, contract approach, management approach, environmental considerations, and source of support.

The acquisition strategy shall include the critical events that shall govern the management of the program. The event-driven acquisition strategy shall explicitly link program decisions to demonstrated accomplishments in development, testing, initial production, and life cycle support.

The acquisition strategy shall be tailored to meet the specific needs of individual programs, including consideration of incremental (block) development and fielding strategies.

The benefits and risks associated with reducing lead time through concurrency shall be specifically addressed in tailoring the acquisition strategy.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
207	PM	document	process source of support		acquisition strategy
208	PM	document	process critical events	linked to project decisions	acquisition strategy
209	PM	tailor	process		acquisition strategy
210	PM	consider	incremental development		acquisition strategy
211	PM	consider	fielding strategies		acquisition strategy
212	PM	analyze	concurrency		acquisition strategy
213	PM	document	concurrency		acquisition strategy

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
214	PM	assess	contractor management requirements		acquisition strategy
215	PM	document	contractor management requirements		acquisition strategy
216	PM	develop	process	at program initiation	acquisition strategy
217	PM	update	process		acquisition strategy
218	PM	consider	views of the WIPT		acquisition strategy
219	MDA	approve	process	prior to release of the formal solicitation	acquisition strategy
220	PM	document	open systems objectives		acquisition strategy

3.3 Acquisition Strategy

In tailoring an acquisition strategy, the PM shall address the management requirements imposed on the contractor(s) (CCA).

The PM shall initially develop the acquisition strategy at program initiation (usually Milestone I),

and shall keep the strategy current by updating it whenever there is a change to the approved acquisition strategy or as the system approach and program elements are better defined.

The PM shall develop the acquisition strategy in coordination with the Working-level Integrated Product Team.

The PEO and CAE, as appropriate, shall concur in the acquisition strategy. The MDA shall approve the acquisition strategy prior to release of the formal solicitation. This approval shall usually precede the milestone review, except at program initiation when the strategy shall usually be approved as part of the initial milestone decision review.

Open Systems

PMs shall specify open systems objectives and document their approach for measuring the level of openness of systems, subsystems, and components to be acquired, and devise an open systems strategy to achieve these requirements.

Applicable DoD 5000.2R Statements

Extracted Requirements

	No.	Subject	Task	Object	Modifier	Using
Open Systems	221	PM	develop	open systems measurement approach	for systems, subsystems and components	acquisition strategy
PMs shall specify open systems objectives and document their approach for measuring the level of openness of systems, subsystems, and components to be acquired, and devise an open systems strategy to achieve these requirements.	222	PM	document	open systems measurement approach	for systems, subsystems and components	acquisition strategy
	223	PM	develop	open systems strategy	for systems, subsystems and components	acquisition strategy
	224	PM	document	open systems strategy	for systems, subsystems and components	acquisition strategy
3.3.2 Sources	225	PM	consider	sources	all domestic and foreign	acquisition strategy
In developing and updating the acquisition strategy, the PM shall consider all prospective sources of supplies and/or services that can meet the need, both domestic and foreign.	226	PM	consider	sources	primary source	commercial items
Commercial and non-developmental items shall be considered as the primary source of supply (10 USC 2377; CCA).	227	PM	consider	sources	primary source	NDI

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3.3.2 Sources

The PM, through the use of Integrated Product Teams (IPTs), shall include in the consideration the national policies on contracting and subcontracting with small business (15 USC 644(a) & (j)), small and disadvantaged business (15 USC 637(d)(4)-(6)), women-owned small business (PL 100-533), and labor surplus areas (15 USC 644(d)).

Alternatives considered to secure participation of these entities as prime contractors in the initial or later phases of the life cycle shall be addressed.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
228	PM	consider	sources	IAW national policies	small business
229	PM	consider	sources	IAW national policies	disadvantaged business
230	PM	consider	sources	IAW national policies	women-owned business
231	PM	consider	sources	IAW national policies	labor surplus areas
232	PM	develop	strategy	as prime contractor	small business
233	PM	develop	strategy	as prime contractor	disadvantaged business
234	PM	develop	strategy	as prime contractor	women-owned business
235	PM	develop	strategy	as prime contractor	labor surplus areas

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3.3.2 Sources — In addition, strategies to ensure participation at the subcontract levels shall be developed.

3.3.2.1 Commercial and Non-Developmental Items — Market research and analysis shall be conducted to determine the availability and suitability of existing commercial and non-developmental items prior to the commencement of a development effort, during the development effort, and prior to the preparation of any product description.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
236	PM	develop	strategy	as subcontractors	small business
237	PM	develop	strategy	as subcontractors	disadvantaged business
238	PM	develop	strategy	as subcontractors	women-owned business
239	PM	develop	strategy	as subcontractors	labor surplus areas
240	PM	determine	availability and suitability	of commercial items	market research
241	PM	determine	availability and suitability	of NDI	market research
242	PM	determine	availability and suitability	of commercial items	market research
243	PM	determine	availability and suitability	of NDI	market research

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3.3.2.1 Commercial and Non-Developmental Items

Market research and analysis shall be conducted to determine the availability and suitability of existing commercial and non-developmental items prior to the commencement of a development effort, during the development effort, and prior to the preparation of any product description.

The PM shall define requirements (including hardware, software, standards, data, and automatic test systems) in terms that enable and encourage offerors to supply commercial and non-developmental items…

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
244	PM	determine	availability and suitability	of commercial items	market analysis
245	PM	determine	availability and suitability	of NDI	market analysis
246	PM	determine	availability and suitability	of commercial items	market analysis
247	PM	determine	availability and suitability	of NDI	market analysis
248	PM	define	requirements	in terms that encourage commercial items	hardware specs
249	PM	define	requirements	in terms that encourage commercial items	software specs
250	PM	define	requirements	in terms that encourage commercial items	standards
251	PM	define	requirements	in terms that encourage commercial items	data specs

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3.3.2.1 Commercial and Non-Developmental Items — The PM shall define requirements (including hardware, software, standards, data, and automatic test systems) in terms that enable and encourage offerors to supply commercial and non-developmental items....

The PM shall require prime contractors and subcontractors at all levels to incorporate commercial and non-developmental items as components of items supplied

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
252	PM	define	requirements	in terms that encourage commercial items	automatic test systems specs
253	PM	define	requirements	in terms that encourage NDI	hardware specs
254	PM	define	requirements	in terms that encourage NDI	software specs
255	PM	define	requirements	in terms that encourage NDI	standards
256	PM	define	requirements	in terms that encourage NDI	data specs
257	PM	define	requirements	in terms that encourage NDI	automatic test systems specs
258	PM	require	commercial items	from prime contractors	contract
259	PM	require	NDI	from prime contractors	contract
260	PM	require	commercial items	from subcontractors	contract

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3.3.2.1 Commercial and Non-Developmental Items

The PM shall require prime contractors and subcontractors at all levels to incorporate commercial and non-developmental items as components of items supplied

and shall modify requirements to the maximum extent practicable, to ensure that the requirements can be met by commercial and non-developmental items (10 USC 2377).

Commercial and non-developmental items selected shall be based on open standards and commercial item descriptions to the maximum extent practicable.

If products with closed interfaces are to be acquired, risks and impacts on total cost of ownership shall be evaluated.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
261	PM	require	NDI	from subcontractors	contract
262	PM	define	requirements	to be met by commercial items	specs
263	PM	define	requirements	to be met by NDI	specs
264	PM	select	commercial items	based on open standards	
265	PM	select	commercial items	based on commercial item descriptions	
266	PM	select	NDI	based on open standards	
267	PM	select	NDI	based on commercial item descriptions	
268	PM	evaluate	risk	of using closed interfaces	

Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.3.2.1 Commercial and Non-Developmental Items: If products with closed interfaces are to be acquired, risks and impacts on total cost of ownership shall be evaluated.	269	PM	evaluate	impact on total cost of ownership	of using closed interfaces	
Preference shall be given to the use of commercial items first and non-developmental items second.	270	PM	use	commercial items	before NDI	
Use of commercial or non-developmental items does not exempt the PM from complying with environmental requirements, unless exempted by statute.	271	PM	consider	environmental requirements	when using commercial or NDI items	
3.3.2.2 Dual Use Technologies and Use of Commercial Plants: The PM shall develop an acquisition strategy that encourages offerors to employ dual use technologies or commercial plants and supplies for defense-unique items, to the maximum extent practicable.	272	PM	encourage	dual use technologies		acquisition strategy
	273	PM	encourage	commercial plants and supplies		acquisition strategy
Market research and analysis shall be conducted to identify and evaluate possible dual use technologies and commercial suppliers throughout research and development.	274	PM	identify	dual use technologies		market research
	275	PM	evaluate	dual use technologies		market analysis
	276	PM	identify	commercial suppliers		market research

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Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
3.3.2.2 Dual Use Technologies and Use of Commercial Plants	Market research and analysis shall be conducted to identify and evaluate possible dual use technologies and commercial suppliers throughout research and development.	277	PM	evaluate	commercial suppliers		Using market analysis
	Contractors shall also be encouraged to integrate military production into commercial production to the maximum extent possible.	278	PM	encourage	integration of military and commercial production		contract
	Finally, system design shall facilitate the incorporation and insertion of leading edge dual use technologies and commercial suppliers through the system's life cycle.	279	PM	develop	system	allow insertion of leading edge dual use technologies	specs
		280	PM	develop	system	allow insertion of commercial suppliers	specs
3.3.2.3 Industrial Capability	The PM shall structure the acquisition strategy to promote sufficient program stability to encourage industry to invest, plan and bear risks.	281	PM	plan	program stability	sufficiently to encourage industry to bear risks	acquisition strategy
	Programs shall minimize the need for new defense-unique industrial capabilities.	282	PM	use	industrial capabilities	that are non-unique	
	Foreign sources and international cooperative developments shall be used where advantageous and within limitations of the law (DFARS Part 225).	283	PM	consider	foreign sources		
		284	PM	consider	cooperative developments		

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3.3.2.3 Industrial Capability

The program acquisition strategy shall analyze the industrial capability to design, develop, produce, support and, if appropriate, restart the program (10 USC 2440).

This analysis shall identify DoD investments needed to create new industrial capabilities, and the risks of industry being unable to provide program design or manufacturing capabilities at planned cost and schedule.

If the analysis indicates there is an issue beyond the scope of the program, the PM shall raise it through the PEO to the MDA.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
285	PM	analyze	industrial capabilities	to design	acquisition strategy
286	PM	analyze	industrial capabilities	to develop	acquisition strategy
287	PM	analyze	industrial capabilities	to produce	acquisition strategy
288	PM	analyze	industrial capabilities	to support	acquisition strategy
289	PM	analyze	industrial capabilities	to restart the program	acquisition strategy
290	PM	identify	industrial capabilities	that are new	acquisition strategy
291	PM	analyze	industrial capabilities	risks of inadequate capability	acquisition strategy
292	PM	report	industrial capabilities	issues to MDA	

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Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
3.3.2.3 Industrial Capability	Prior to production termination, Components shall take actions to ensure there will be adequate industrial capabilities and capacity to meet post-production operational needs. Actions shall address product technology obsolescence, replacement of life limited items, and regeneration options for unique manufacturing processes.	293	PM	plan	industrial capabilities	to handle product technology obsolescence	
		294	PM	plan	industrial capabilities	to handle replacement of life limited items	
		295	PM	plan	industrial capabilities	to handle regeneration options for unique manufacturing processes	
Critical Product and Technology Competition	All acquisition programs shall foster competition at subcontractors levels, as well as at the prime level, particularly in critical product and technology areas.	296	PM	use	competition		acquisition strategy
	To accomplish this, the PM shall focus on critical product and technology competition when: a) formulating the acquisition strategy; b) exchanging information with industry; and c) managing the program system engineering and life cycle.	296	PM	use	competition		acquisition strategy
	The acquisition strategy shall be based, in part, on an analysis of product and technology areas critical to meeting the program's needs.	298	PM	analyze	critical product areas		acquisition strategy
		299	PM	analyze	critical technology areas		acquisition strategy

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Critical Product and Technology Competition

The acquisition strategy shall identify the potential industry sources available to supply these critical products and technologies.

The acquisition strategy shall highlight areas of potential vertical integration, that is, areas where potential prime contractors are also potential suppliers for critical products and technologies.

The acquisition strategy shall describe the approaches the PM will use (e.g., requiring an open systems architecture, investing in alternate technology or product solutions, breaking out a subsystem or component, etc.) to establish or maintain access to competitive suppliers for critical areas at the system, subsystem, and component levels. -

During early exchanges of information with industry (e.g., the draft RFP process), PMs shall identify those critical product and technology areas that the primes plan to provide internally or through exclusive teaming, and assess possible competition effects of these choices.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
300	PM	identify	sources		acquisition strategy
301	PM	identify	vertical integration		acquisition strategy
302	PM	describe	approaches	requiring open systems architecture	acquisition strategy
303	PM	describe	approaches	investing in alternate technology	acquisition strategy
304	PM	describe	approaches	breaking out subsystem or component	acquisition strategy
305	PM	identify	critical product areas	prime plans to provide internally	
306	PM	identify	critical technology areas	prime plans to provide internally	

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Extracted Requirements

Critical Product and Technology Competition

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
During early exchanges of information with industry (e.g., the draft RFP process), PMs shall identify those critical product and technology areas that the primes plan to provide internally or through exclusive teaming, and assess possible competition effects of these choices.	307	PM	identify	critical product areas	prime plans to provide through exclusive teaming	
	308	PM	identify	critical technology areas	prime plans to provide through exclusive teaming	
	309	PM	assess	effects	of prime choices	
The PM shall take action to mitigate areas of risk. When those actions require a change to the approved acquisition strategy, the PM shall recommend the needed change to the MDA.	310	PM	mitigate	risk		acquisition strategy
As the designs evolve, the PM shall continue to analyze how the prime contractor is addressing the program's critical product and technology areas.	311	PM	analyze	critical product areas	being addressed by the prime	
	312	PM	analyze	critical technology areas	being addressed by the prime	
Contractors shall be challenged during requirements and design reviews to support why planned materiel solutions for subsystem and component requirements critical to the program are appropriate when other choices are available. This monitoring shall continue through the weapon system life cycle (e.g., reprocurements, logistics support).	313	PM	obtain	justification	for materiel solutions provided by contractor	reviews

Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.3.2.5 Leasing The PM shall consider the use of leasing in the acquisition of commercial vehicles and equipment whenever the PM determines that leasing of such vehicles is practicable and efficient.	314	PM	consider	leasing	commercial items	
The PM shall not enter into any lease with a term of 18 months or more, or extend or renew any lease for a term of 18 months or more, for any vessel, aircraft, or vehicle, unless the PM has considered all costs of such a lease (including estimated termination liability) and has determined in writing that the lease is in the best interest of the Government. (10 USC 2401a)	315	PM	consider	all costs	of leases greater than 18 months	
	316	PM	document	all costs	of leases greater than 18 months	
3.3.3 Cost, Schedule, and Performance Risk Management The PM shall establish a risk management program for each acquisition program to identify and control performance, cost, and schedule risks.	317	PM	establish	risk management program	risk management program for	risk management program
The risk management program shall identify and track risk drivers, define risk abatement plans, and provide for continuous risk assessment throughout each acquisition phase to determine how risks have changed.	318	PM	identify	risk drivers		risk management program
	319	PM	track	risk drivers		risk management program
	320	PM	define	risk abatement plans		risk management program

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Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.3.3 Cost, Schedule, and Performance Risk Management — The risk management program shall identify and track risk drivers, define risk abatement plans, and provide for continuous risk assessment throughout each acquisition phase to determine how risks have changed.	321	PM	plan	continuous risk assessment		risk management program
Risk reduction measures shall be included in cost-performance trade-offs, where applicable.	322	PM	analyze	risk reduction measures		cost-performance trade-offs
The risk management program shall plan for back-ups in risk areas and identify design requirements where performance increase is small relative to cost, schedule, and performance risk.	323	PM	plan	back-ups		risk management program
	324	PM	identify	risk drivers		risk management program
The acquisition strategy shall include identification of the risk areas of the program and a discussion of how the PM intends to manage those risks.	325	PM	identify	risk areas		acquisition strategy
	326	PM	plan	risk management program		acquisition strategy
3.3.4 Cost as an Independent Variable (CAIV) — The CAIV process shall be used to develop an acquisition strategy for acquiring and operating affordable DoD systems by setting aggressive, achievable cost objectives and managing achievement of these objectives.	327	PM	use	CAIV	setting aggressive, achievable cost objectives	acquisition strategy
	328	PM	manage	CAIV	objective achievement	

Applicable DoD 5000.2R Statements

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
329	PM	set	CAIV	to balance mission needs with out-year resources	
330	PM	set	CAIV	taking into account process improvements	
331	PM	analyze	cost/performance		trade-off analyses
332	PM	establish	CAIV based objectives	when MNS approved	acquisition strategy
333	PM	consider	projected out-year resources		life cycle cost objectives
334	PM	consider	recent unit costs		life cycle cost objectives
335	PM	consider	parametric estimates		life cycle cost objectives

3.3.4 Cost as an Independent Variable (CAIV)

Cost objectives shall also be set to balance mission needs with projected out-year resources, taking into account anticipated process improvements in both DoD and defense industries (GPRA and CCA).

3.3.4.1 Cost/Performance Tradeoffs

Cost reductions shall be accomplished through cost/performance tradeoff analyses, which shall be conducted before an acquisition approach is finalized.

Upon approval of a MNS (see 2.3), a CAIV strategy shall be formulated as part of the acquisition strategy to set cost objectives.

By program initiation (usually Milestone I), each ACAT I and ACAT IA PM shall have established life cycle cost objectives for the program through consideration of projected out-year resources, recent unit costs, parametric estimates, mission effectiveness analysis and trades, technology trends, and other relevant considerations such as commercial versus DoD specifications (see 3.3.5.2) and the open systems strategy and design (see 3.3.1 and 4.3.4).

Applicable DoD 5000.2R Statements

3.3.4.1 Cost/Performance Tradeoffs

By program initiation (usually Milestone I), each ACAT I and ACAT IA PM shall have established life cycle cost objectives for the program through consideration of projected out-year resources, recent unit costs, parametric estimates, mission effectiveness analysis and trades, technology trends, and other relevant considerations such as commercial versus DoD specifications (see 3.3.5.2) and the open systems strategy and design (see 3.3.1 and 4.3.4).

A complete set of life cycle cost objectives shall include RDT&E, production, MILCON, operating and support, and disposal costs.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
336	PM	consider	mission effectiveness analysis and		life cycle cost objectives
337	PM	consider	technology trends		life cycle cost objectives
338	PM	consider	commercial vs DOD specs		life cycle cost objectives
339	PM	consider	open systems strategy and		life cycle cost objectives
340	PM	consider	RDT&E costs		life cycle cost objectives
341	PM	consider	production costs		life cycle cost objectives
342	PM	consider	MILCON costs		life cycle cost objectives
343	PM	consider	operating costs		life cycle cost objectives

Applicable DoD 5000.2R Statements

Extracted Requirements

3.3.4.1 Cost/Performance Tradeoffs	No.	Subject	Task	Object	Modifier	Using
A complete set of life cycle cost objectives shall include RDT&E, production, MILCON, operating and support, and disposal costs.	344	PM	consider	support costs		life cycle cost objectives
	345	PM	consider	disposal costs		life cycle cost objectives
At each subsequent milestone review, cost objectives and progress towards achieving them shall be reassessed.	346	Both	assess	cost objectives		
	347	Both	assess	cost objectives performance		
the number of threshold items in requirements documents and acquisition program baselines shall be strictly limited, the threshold values shall represent true minimums, and requirements shall be stated in terms of capabilities, rather than technical solutions and specifications.	348	User	document	requirements	limited in number	ORD
	349	Both	document	requirements	limited in number	APB
	350	User	establish	requirements	thresholds that are true minimums	
	351	All	document	requirements	as capabilities vs technical solutions	

Applicable DoD 5000.2R Statements

Extracted Requirements

3.3.4.1 Cost/Performance Tradeoffs

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
RFPs shall include a strict minimum number of critical performance criteria that allow industry maximum flexibility to meet overall program objectives.	352	PM	document	requirements	minimize number of criteria	RFP
Cost objectives shall be used as a management tool.	353	PM	use	CAIV		
The source selection criteria communicated to industry shall reflect the importance of developing a system that can achieve stated production and life cycle cost objectives.	354	PM	establish	source selection criteria	to achieve production objectives	
	355	PM	establish	source selection criteria	to achieve life cycle cost objectives	
The CPIPT (normally led by the PM or the PM's representative) shall be empowered to recommend to the PM performance or engineering and design changes as long as the threshold values in the Operational Requirements Document (ORD) and APB can be achieved. If the changes require ORD/APB threshold value changes, the leader of the CPIPT shall notify the PM and the OIPT leader.	356	PM	use	CPIPT	in specified way	
The PM shall ensure that proposed changes are quickly brought before the ORD and/or APB approval authorities for decision.	357	PM	report	requirements changes	quickly	
The PM shall have responsibility for the conduct and integration of all cost performance trade-off analyses conducted.	358	PM	conduct	cost performance		trade-off analyses

Applicable DoD 5000.2R Statements

Extracted Requirements

	Statement	No.	Subject	Task	Object	Modifier	Using
3.3.4.2 Cost Management Incentives	RFPs shall be structured to incentivize the contractor to meet or exceed cost objectives.	359	PM	structure	incentives	to meet or exceed cost objectives	RFP
	Whenever applicable, risk reduction through use of mature processes shall be a significant factor in source selection.	360	PM	use	risk reduction measures	contractor uses mature processes	RFP
	Therefore, competition shall be maintained for as long as practicable in all acquisition programs.	296	PM	use	competition		acquisition strategy
	Incentives shall be applied to both Government and industry to achieve the objectives of cost as an independent variable.	362	PM	use	incentives	for CAIV	RFP
		363	PM	use	incentives	for CAIV	Gov't SOW's
	Awards programs (both monetary and non-monetary) and "shared savings" programs shall be used creatively to encourage the generation of cost-saving ideas for all phases of life cycle costs.	364	PM	use	awards, monetary	for CAIV	
		365	PM	use	awards, non-monetary	for CAIV	
		366	PM	use	shared savings	for CAIV	
	Incentive programs shall target both individuals and teams in both government and industry.	367	PM	use	incentives	for industry individuals	

Applicable DoD 5000.2R Statements

DoD 5000.2R Statement	Statement text
3.3.4.2 Cost Management Incentives	Incentive programs shall target both individuals and teams in both government and industry.
	Incentives shall stress up-front investments to minimize production and/or operation and support costs, where applicable.
3.3.5 Contract Approach	The acquisition strategy shall discuss the types of contracts contemplated for each succeeding phase, including considerations of risk assessment, reasonable risk-sharing by Government and contractor(s), and the incentive structure for contractors to decrease cost (CCA).
	The strategy shall specify if options are to be used for future requirements.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
368	PM	use	incentives	for industry teams	
369	PM	use	incentives	for government individuals	
370	PM	use	incentives	for government teams	
371	PM	use	incentives	to increase up-front investments	
372	PM	consider	risk assessment	for contract types	acquisition strategy
373	PM	consider	risk-sharing	for contract types	acquisition strategy
374	PM	consider	incentives	for contract types	acquisition strategy
375	PM	consider	options	for contract types	acquisition strategy

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Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.3.5 Contract Approach						
Fixed price development contracts of $25 million or more or fixed price type contracts for lead ships shall not be used without the prior approval of the USD(A&T) (DFARS 235.006).	376	PM	obtain	approval	for fixed price development contracts => $25M	acquisition strategy
Multiyear contracting shall be considered for full rate production and implemented when the requirements of FAR 17.1 are satisfied.	377	PM	consider	multiyear contracting		
Multiyear contracting shall be done in accordance with 10 USC 2306b.	378	PM	conduct	multiyear contracting	in specified way	
To the maximum extent practicable, modular contracting, as described in Section 5202 of Division E of the Clinger-Cohen Act, shall be used for major information technology acquisitions.	379	PM	use	modular contracting	for major information technology acquisitions	
3.3.5.1 Competition PMs and contracting officers shall provide for full and open competition, unless one of the limited statutory exceptions apply (FAR 6.3).	380	PM	use	competition		
PMs and contracting officers shall use competitive procedures best suited to the circumstances of the acquisition program.	381	PM	use	competition	that is best suited	
The acquisition strategy for all acquisition programs shall describe plans to attain program goals via competition in all increments and life cycle phases.	382	PM	plan	competition		acquisition strategy
Competitive prototyping, competitive alternative sources, and competition with other systems that may be able to accomplish the mission shall be used where practicable.	383	PM	use	competition	in prototyping	

Applicable DoD 5000.2R Statements

3.3.5.1 Competition Competitive prototyping, competitive alternative sources, and competition with other systems that may be able to accomplish the mission shall be used where practicable.

The PM shall consider component breakout.

The acquisition strategy shall address component breakout plans and shall include rationale justifying the component breakout strategy (DFARS Appendix D).

Component breakout shall be considered on every program and shall be done when there are significant cost savings (inclusive of Government administrative costs), when the technical or schedule risk of furnishing government items to the prime contractor is manageable, and when there are no other overriding Governmental interests (e.g., industrial capability considerations or dependence on contractor logistics support).

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
384	PM	use	competition	of alternative sources	
385	PM	use	competition	with other systems	
386	PM	consider	component breakout		
387	PM	plan	component breakout	plans and justification	acquisition strategy
386	PM	consider	component breakout		
389	PM	use	component breakout	when there are significant savings	
390	PM	use	component breakout	when technical or schedule risk of GFE is manageable	

Applicable DoD 5000.2R Statements

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using

3.3.5.1 Competition Component breakout shall be considered on every program and shall be done when there are significant cost savings (inclusive of Government administrative costs), when the technical or schedule risk of furnishing government items to the prime contractor is manageable, and when there are no other overriding Governmental interests (e.g., industrial capability considerations or dependence on contractor logistics support).

No.	Subject	Task	Object	Modifier	Using
391	PM	use	component breakout	when there are no overriding Gov't interests	

Components considered for breakout shall be listed, and a brief rationale (based on supporting analyses from a detailed component breakout review (which shall not be provided to the MDA unless specifically requested)) for those major components where a decision was made not to breakout shall be provided. A decision not to break out any components shall also require justification.

No.	Subject	Task	Object	Modifier	Using
392	PM	analyze	component breakout		detailed component breakout review

3.3.5.2 Best Practices
PMs shall avoid imposing government-unique requirements that significantly increase industry compliance costs.

No.	Subject	Task	Object	Modifier	Using
393	PM	analyze	requirements	for industry compliance costs	

The use of best practices shall be addressed at each milestone review.

No.	Subject	Task	Object	Modifier	Using
394	Both	review	best practices		

3.3.5.3 Cost Performance
When applicable, the contract shall require that any system used by the contractor in planning and controlling the performance of the contract shall meet the criteria set forth in Appendix VI.(earned value)

No.	Subject	Task	Object	Modifier	Using
395	PM	require	earned value	compliance	Appendix VI, DOD 5000.2R

The government shall not require the contractor's internal systems to be changed provided they satisfy these criteria.

No.	Subject	Task	Object	Modifier	Using
396	PM	use	contractor internal systems	if they comply	Appendix VI, DOD 5000.2R

Applicable DoD 5000.2R Statements

Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
3.3.5.3 Cost Performance	Unless waived by the MDA or a designated representative, compliance with the EVMS criteria shall be required on significant contracts and subcontracts within all acquisition programs, including highly sensitive classified programs and major construction programs.	397	PM	require	earned value		Using contracts
		398	PM	require	earned value		subcontracts
	On contracts that are determined to be not significant enough for EVMS criteria applicability, the cost/schedule status report (C/SSR) (see 6.4.3) shall be required unless excluded in accordance with the following paragraph.	399	PM	require	C/SSR		contracts
	Compliance with the EVMS criteria shall not be required on firm fixed price contracts (including firm fixed price contracts with economic price adjustment provisions), time and materials contracts, and contracts which consist mostly of level-of-effort work. Exceptions may be made by the MDA for individual contracts.	400	PM	not require	earned value	if firm fixed price, T&M, and level of effort	contracts
3.3.5.3.1 Integrated Baseline Reviews	For contracts requiring compliance with DoD EVMS criteria (see 3.3.5.3) or Cost/Schedule Status Report (C/SSR) requirements (see 6.4.3), program managers and their technical staffs or Integrated Product Teams (IPTs) shall review contractor planning baselines within six months after contract award.	401	PM	review	contractor earned value planning baselines	within six months after contract award	
3.3.5.4 Advance Procurement	In accordance with DoD 7000.14-R , procurement of end items shall be fully funded, i.e., the cost of the end items to be bought in any fiscal year shall be completely included in that year's budget request.	402	PM	fund	full year procurement	that year	budget request

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using

3.3.5.4 Advance Procurement

(mult-year funding to maintain critical skills...) this acquisition technique shall be used only when the cost benefits are significant and only with approval of the MDA.

No.	Subject	Task	Object	Modifier	Using
403	PM	analyze	multiyear funding		

Exit criteria for awarding of the initial long lead-time items contract and/or for awarding of individual follow-on long lead-time lots shall be established as an integral part of the milestone approval process.

| 404 | Both | establish | initial long lead-time items | exit criteria for award | |

These approved exit criteria shall be satisfied before any advance procurement funding may be released.

| 405 | PM | accomplish | exit criteria | prior to release of advance procurement funds | |

The initiation of advance procurement in support of long lead material shall use a separate contract.

| 406 | PM | fund | initial long lead-time items | for advanced procurement | separate contract |

3.3.5.5 Continuous Acquisition and Life Cycle Support (CALS) --Acquisition Program Integrated Digital Environment (IDE)

Beginning in FY97, all new contracts shall require on-line access to, or delivery of, their programmatic and technical data in digital form, unless analysis shows that life cycle time or life cycle costs would be increased by doing so.

407	PM	analyze	life cycle costs	of required online access	
408	PM	analyze	life cycle schedule	of required online access	
409	PM	require	online access of contractor data		contracts

Applicable DoD 5000.2R Statements

3.3.5.5 Continuous Acquisition and Life Cycle Support (CALS)
--Acquisition
Program Integrated Digital Environment (IDE)

Extracted Requirements

No.	Statement	Subject	Task	Object	Modifier	Using
410	Preference shall be given to on-line access to contractor developed data through contractor information services or existing information technology infrastructure rather than data delivery.	PM	use	existing information technology infrastructure		
411	The PM shall be responsible for establishing a data management system and appropriate IDE that meets the data requirements of the program throughout its total life cycle.	PM	establish	data management system	meeting total life cycle program requirements	
412		PM	establish	IDE	meeting total life cycle program requirements	
413	MDAs shall assess the IDE developed to enhance the program and mitigate long-term costs at each milestone and program review.	MDA	assess	IDE		
414	Acquisition strategies and plans shall describe the extent of implementation of these requirements in accordance with DFARS 207.105 .	PM	plan	data management system		acquisition strategy
415		PM	plan	IDE		acquisition strategy
416	Solicitations shall require specific proposals for an IDE to support systems engineering and logistics activities.	PM	require	IDE proposal	to support systems engineering	proposal

Applicable DoD 5000.2R Statements

Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.3.5.5 Continuous Acquisition and Life Cycle Support (CALS) --Acquisition Program Integrated Digital Environment (IDE)	417	PM	require	IDE proposal	to support logistics activities	Using proposal
Solicitations shall require specific proposals for an IDE to support systems engineering and logistics activities.						
The PM shall ensure compatibility of data deliverables with existing internal information systems, and augment such systems as required to provide timely data access and distribution consistent with DFARS 227 and 252 .	418	PM	use	existing information technology infrastructure	for data deliverables	
	419	PM	provide	timely data access	consistent with DFARS 227 and 252	existing information technology infrastructure
	420	PM	provide	data distribution	consistent with DFARS 227 and 252	existing information technology infrastructure
Programs electing not to use the data management processes described in DOD 5010.12-M must find other ways to comply with Public Law 104-13, The Paperwork Reduction Act of 1995 (PRA).	421	PM	comply	Public Law 104-13		
3.3.6 Management Approach — The acquisition strategy shall be developed in sufficient detail to establish the managerial approach that shall be used to achieve program goals.	422	PM	establish	managerial approach		acquisition strategy

Applicable DoD 5000.2R Statements

Extracted Requirements

	No.	Subject	Task	Object	Modifier	Using
3.3.6.1 Streamlining						
The PM shall streamline all acquisitions so that the acquisitions contain only those requirements that are essential and cost-effective.	423	PM	analyze	requirements	for essentialness	acquisition strategy
	424	PM	analyze	requirements	for cost-effectiveness	acquisition strategy
Contract requirements shall be stated in terms of performance rather than design-specific procedures.	425	PM	describe	requirements	in performance terms	RFP
Management data requirements shall be limited to those essential for effective control.	426	PM	analyze	data requirements	for essentialness	
Acquisition process requirements shall be tailored to meet the specific needs of individual programs.	427	PM	tailor	acquisition		acquisition strategy
Relief or exemption shall be sought for those requirements that fail to add value, are not essential, or are not cost-effective.	428	PM	analyze	requirements	for essentialness	
	429	PM	analyze	requirements	for cost-effectiveness	
Early industry involvement in the acquisition effort, consistent with the Federal Advisory Committee Act (FACA), shall be encouraged to take advantage of industry expertise to improve the acquisition strategy.	430	PM	involve	industry		
	431	PM	involve	industry	IAW FACA	

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Applicable DoD 5000.2R Statements

3.3.6.2 International Considerations

The acquisition strategy shall discuss the potential for enhancing reciprocal defense trade and cooperation, including international cooperative research, development, production, logistic support, and the sale of military equipment, consistent with the maintenance of a strong national technology and industrial base, and mobilization capability.

This discussion shall meet the requirements specified for the cooperative opportunities reported directed by 10 USC 2350a(g) .

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
432	PM	analyze	reciprocal defense trade and cooperation	consistent with strong tech and industrial base	acquisition strategy
433	PM	analyze	international cooperative research	consistent with strong tech and industrial base	acquisition strategy
434	PM	analyze	international cooperative development	consistent with strong tech and industrial base	acquisition strategy
435	PM	analyze	international cooperative production	consistent with strong tech and industrial base	acquisition strategy
436	PM	analyze	international cooperative logistic support	consistent with strong tech and industrial base	acquisition strategy
437	PM	analyze	international cooperative sale of military equipment	consistent with strong tech and industrial base	acquisition strategy
438	PM	analyze	reciprocal defense trade and cooperation	IAW 10 USC 2350a(q)	

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Applicable DoD 5000.2R Statements

Extracted Requirements

Statement	No.	Subject	Task	Object	Modifier	Using
3.3.6.2 International Considerations						
If foreign competition is restricted for industrial base reasons, USD(A&T) prior approval is required.	439	PM	obtain	USD(A&T) approval	for restrictions on foreign competition	
Prior to entering into a cooperative agreement, the program shall be reviewed by the MDA and be approved as an international program.	440	MDA	approve	reciprocal defense trade and cooperation	as an international program	
The USD(A&T) shall approve any foreign military sale, commitment to sell, or DoD agreement for licensing the export of any ACAT I or II system that has not successfully completed the Operational Test and Evaluation (OT&E) required prior to approval for full rate U.S. production.	441	PM	obtain	USD(A&T) approval	for foreign military sale	
	442	PM	obtain	USD(A&T) approval	commitment to sell	
	443	PM	obtain	USD(A&T) approval	agreement for licensing export	
3.3.6.3 Joint Program Management						
Joint programs shall be consolidated and collocated at the location of the lead Component's program office, to the maximum extent practicable.	444	PM	locate	office	at lead component program office	Joint program
The relationship between the designated organization and the Military Departments and Defense Agencies, and their respective responsibilities, shall be specified in a Memorandum of Agreement (MOA).	445	PM	establish	MOA's	with other services in joint program	Joint program

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3.3.6.3 Joint Program Management

Mission needs, operational requirements, and program strategies shall be structured to encourage and to provide an opportunity for multi-Component participation.

The decision to establish a joint program shall be made by the MDA, who shall designate the lead Component as early in the acquisition process as possible.

The selected joint program manager is fully responsible and accountable for the cost, schedule, and performance of the system development.

A designated joint program shall have one quality assurance program, one program change control program, one integrated test program, and one set of documentation and reports to include one joint program ORD, one Test and Evaluation Master Plan (TEMP), one APB, one DAES, one Quarterly Report for ACAT IA programs, and one Selected Acquisition Report (SAR) for ACAT I programs.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
446	User	encourage	Joint program		MNS
447	User	encourage	Joint program		ORD
448	PM	encourage	Joint program		acquisition strategy
449	MDA	establish	Joint program		
450	PM	account for	cost performance		Joint program
451	PM	account for	schedule performance		Joint program
452	PM	account for	technical performance		Joint program
453	PM	establish	quality assurance program	one each	Joint program

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3.3.6.3 Joint Program Management

A designated joint program shall have one quality assurance program, one program change control program, one integrated test program, and one set of documentation and reports to include one joint program ORD, one Test and Evaluation Master Plan (TEMP), one APB, one DAES, one Quarterly Report for ACAT IA programs, and one Selected Acquisition Report (SAR) for ACAT I programs.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
454	PM	establish	program change control program	one each	Joint program
455	PM	establish	integrated test program	one each	Joint program
456	PM	establish	set of documentation	one each	Joint program
457	PM	establish	ORD	one each	Joint program
458	PM	establish	TEMP	one each	Joint program
459	PM	establish	APB	one each	Joint program
460	PM	establish	DAES	one each	Joint program
461	PM	establish	Quarterly Report	one each	Joint program
462	PM	establish	SAR	one each	Joint program

Applicable DoD 5000.2R Statements

Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
3.3.6.5 Technical Representatives at Contractor Facilities	PMs shall make maximum use of Defense Contract Management Command (DCMC) personnel at contractor facilities.	463	PM	use	DCMC		
	PMs and DCMC Contract Administration Offices shall jointly develop and approve program support plans for all ACAT I program contracts to ensure agreement on contract oversight needs and perspectives.	464	PM	plan	contract oversight	ensure agreement with DCMC	
	Assignment of PM technical representatives in a contractor's facility shall occur only as necessary, shall be based on the mutual agreement of the respective PM and the Commander, DCMC, and shall be reflected in a Memorandum of Agreement that specifies the duties to be performed by the technical representative.	463	PM	use	DCMC		
	In these cases, technical representatives shall not perform contract administration duties as outlined in FAR 42.302(a) .	463	PM	use	DCMC		
3.3.6.6 Information Sharing and DoD Oversight	DoD oversight activities (i.e., contract administration offices, contracting offices, technical activities, and program management offices) shall consider all relevant and credible information that might mitigate risks and the need for DoD oversight before designing and applying direct DoD oversight of contractor operations.	467	PM	plan	contract oversight	to mitigate risks and DOD oversight	
	DoD buying and technical activities shall provide to the Commander, DCMC copies of reviews of contractor operations and other documents assessing or rating contractor performance or operations.	468	PM	provide	contractor reviews	to DCMC	

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Applicable DoD 5000.2R Statements

Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
3.3.7 Environmental, Safety, and Health Considerations	The acquisition strategy shall include a programmatic environmental, safety, and health (ESH) evaluation.	469	PM	conduct	ESH evaluation		acquisition strategy
	The PM shall initiate the ESH evaluation at the earliest possible time in support of a program initiation decision (usually Milestone I) and shall maintain an updated evaluation throughout the life cycle of the program.	470	PM	conduct	ESH evaluation		acquisition strategy
3.3.8 Source of Support	Support concepts for new and modified systems shall maximize the use of contractor provided, long-term, total life cycle logistics support that combines depot-level maintenance for non-core-related workload along with wholesale and selected retail materiel management functions.	471	PM	use	contractor support	for non-core-related work	
	Best value over the life cycle of the weapon system and use of existing contractor capabilities, particularly while the system is in production, shall be key determinants in the overall decision process.	472	PM	use	best value		
		473	PM	use	existing contractor capabilities		
	The PM shall provide for long-term access to data required for competitive sourcing of systems support throughout its life cycle.	474	PM	obtain	data	for competitive sourcing of systems support	contract
3.3.9 Warranties	10 USC 2403 mandates the use of warranties in weapon system production that apply to essential performance requirements as well as design and manufacturing, and materials and workmanship.	475	PM	use	warranties	IAW 10 USC 2403	contract

Applicable DoD 5000.2R Statements

3.3.9 Warranties

The PM shall incorporate warranty requirements into program contracts in accordance with DFARS 246.770 , unless a waiver is approved consistent with DFARS 246.770-8 .

3.4 Test and Evaluation

Test and evaluation programs shall be structured to integrate all developmental test and evaluation (DT&E), operational test and evaluation (OT&E), live-fire test and evaluation (LFT&E), and modeling and simulation activities conducted by different agencies as an efficient continuum.

All such activities shall be part of a strategy to provide information regarding risk and risk mitigation, to provide empirical data to validate models and simulations, to permit an assessment of the attainment of technical performance specifications and system maturity, and to determine whether systems are operationally effective, suitable, and survivable for intended use.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
476	PM	use	warranties	IAW DFARS 246.770	contract
477	PM	coordinate	modeling, simulation and test activities		
478	PM	plan	data collection	for risk and risk mitigation	modeling, simulation and test strategy
479	PM	plan	data collection	to validate models and simulations	modeling, simulation and test strategy
480	PM	plan	data collection	assess technical performance	modeling, simulation and test strategy
481	PM	plan	data collection	assess system maturity	modeling, simulation and test strategy

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3.4 Test and Evaluation

All such activities shall be part of a strategy to provide information regarding risk and risk mitigation, to provide empirical data to validate models and simulations, to permit an assessment of the attainment of technical performance specifications and system maturity, and to determine whether systems are operationally effective, suitable, and survivable for intended use.

For ACAT I and II programs for conventional weapons systems designed for use in combat, a beyond low-rate initial production decision shall be supported by completed independent initial operational test and evaluation as required by 10 USC 2399 and by completed live fire test and evaluation as required by 10 USC 2366.

Operational test and evaluation does not include an operational assessment based exclusively on computer modeling, simulation, or an analysis of system requirements, engineering proposals, design specification, or any other information contained in program documents (10 USC 2399).

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
482	PM	plan	data collection	determine operational effectiveness	modeling, simulation and test strategy
483	PM	plan	data collection	determine operational suitability	modeling, simulation and test strategy
484	PM	plan	data collection	determine operational survivability	modeling, simulation and test strategy
485	PM	accomplish	IOT&E	prior to a beyond low-rate initial production decision	
486	PM	accomplish	LFT&E	prior to a beyond low-rate initial production decision	
487	PM	collect	data	for OT&E	

Applicable DoD 5000.2R Statements   Extracted Requirements

		No.	Subject	Task	Object	Modifier	Using
3.4.1 Test and Evaluation Strategy	Test and evaluation planning shall begin in Phase 0, Concept Exploration.	488	PM	plan	T&E		
	Both developmental and operational testers shall be involved early to ensure that the test program for the most promising alternative can support the acquisition strategy and to ensure the harmonization of objectives, thresholds, and measures of effectiveness (MOEs) in the ORD and TEMP.	489	PM	involve	testers		
	Test and evaluation planning shall address MOEs and measures of performance (MOPs) with appropriate quantitative criteria, test event or scenario description, resource requirements (e.g., special instrumentation, test articles, validated threat targets, validated threat simulators and validated threat simulations, actual threat systems or surrogates, and personnel), and identify test limitations.	490	PM	address	test MOEs		test planning
		491	PM	address	test MOPs		test planning
		492	PM	address	test quantitative criteria		test planning
		493	PM	address	test events		test planning
		494	PM	address	test scenario descriptions		test planning
		495	PM	address	test resource requirements		test planning

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Extracted Requirements

Statement (Applicable DoD 5000.2R Statements)	No.	Subject	Task	Object	Modifier	Using
3.4.1 Test and Evaluation Strategy — Test and evaluation planning shall address MOEs and measures of performance (MOPs) with appropriate quantitative criteria, test event or scenario description, resource requirements (e.g., special instrumentation, test articles, validated threat targets, validated threat simulators and validated threat simulations, actual threat systems or surrogates, and personnel), and identify test limitations.	496	PM	address	test limitations		test planning
Test planning, at a minimum, shall address all system components (hardware, software and human interfaces) that are critical to the achievement and demonstration of contract technical performance specifications and operational effectiveness and suitability requirements from the ORD.	497	PM	address	all system components		test planning
	498	PM	address	hardware		test planning
	499	PM	address	software		test planning
	500	PM	address	human interfaces		test planning
Quantitative criteria shall be phased so as to provide substantive evidence for analysis of hardware, software and system maturity and readiness to proceed through the acquisition process.	501	PM	establish	quantitative test criteria	for analysis of hardware	test planning
	502	PM	establish	quantitative test criteria	for analysis of software	test planning
	503	PM	establish	quantitative test criteria	for analysis of system maturity	test planning

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3.4.1 Test and Evaluation Strategy

Linkage shall exist among the various MOEs and MOPs used in the analysis of alternatives or ORD, and test and evaluation; in particular, the MOEs, MOPs, and criteria in the ORD, the analysis of alternatives, the TEMP and the APB shall be consistent.

Test and evaluation planning must provide for completion of Initial Operational Test and Evaluation (IOT&E) and Live Fire Test and Evaluation (LFT&E), as required, before entering full-rate production.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
504	PM	link	MOEs	with other program criteria	test planning
505	PM	link	MOPs	with other program criteria	test planning
506	PM	link	ORD criteria	with other program criteria	test planning
507	PM	link	analysis of alternative criteria	with other program criteria	test planning
508	PM	link	TEMP criteria	with other program criteria	test planning
509	PM	link	APB criteria	with other program criteria	test planning
510	PM	plan	IOT&E	complete	test planning
511	PM	plan	LFT&E	complete	test planning

Applicable DoD 5000.2R Statements

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using	Statement
						3.4.1 Test and Evaluation Strategy
512	PM	consider	LFT&E	for commercial items	test planning	Test planning for these items (commercial and non-developmental items) shall include consideration of operational testing and LFT&E needed to assure effective performance in the intended operational environment.
513	PM	consider	IOT&E	for NDI	test planning	
514	PM	analyze	commercial items	for commercial testing and experience	test planning	However, the test program shall be tailored to recognize commercial testing and experience.
515	PM	tailor	testing	for commercial testing and experience	test planning	
516	PM	consider	existing DOD ranges		test planning	Testing shall be planned and conducted to take full advantage of existing investment in DoD ranges, facilities, and other resources, wherever practical, unless otherwise justified in the TEMP.
517	PM	consider	existing DOD facilities		test planning	
518	PM	consider	other existing DOD resources		test planning	
519	PM	identify	risk		EUT&E	Early testing of prototypes in Phase I, Program Definition and Risk Reduction, and early operational assessments shall be emphasized to assist in identifying risks.

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Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.4.1 Test and Evaluation Strategy Modeling and simulation shall be an integral part of test and evaluation planning.	520	PM	use	modeling and simulation		test planning
A final independent phase of operational test and evaluation shall be required for beyond low-rate initial production (LRIP) decisions.	521	PM	conduct	OT&E	prior to a beyond low-rate initial production decision	
3.4.2 Developmental Test and Evaluation Identify potential operational and technological capabilities and limitations of the alternative concepts and design options being pursued	522	PM	measure	system performance capability		DT&E
Support the identification of cost-performance trade-offs by providing analyses of the capabilities and limitations of alternatives	523	PM	measure	alternative system performance capability		DT&E
Support the identification and description of design technical risks	522	PM	measure	system performance capability		DT&E
Assess progress toward meeting Critical Operational Issues, mitigation of acquisition technical risk, achievement of manufacturing process requirements and system maturity	522	PM	measure	system performance capability		DT&E
Assess validity of assumptions and conclusions from the analysis of alternatives	522	PM	measure	system performance capability		DT&E
Provide data and analysis in support of the decision to certify the system ready for operational test and evaluation	522	PM	measure	system performance capability		DT&E

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Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
3.4.2 Developmental Test and Evaluation In the case of automated information systems, support an information systems security certification prior to processing classified or sensitive data and ensure a standards conformance certification.	522	PM	measure	system performance capability		DT&E
3.4.3 Certification of Readiness for Operational Test and Evaluation The developing agency shall prepare a DT&E Report, and formally certify that the system is ready for the next dedicated phase of operational test and evaluation to be conducted by the DoD Component operational test activity.	529	PM	certify	system performance capability	prior to operational test	DT&E Report
The developing agency shall establish maturity criteria and performance exit criteria necessary for certification for operational test.	530	PM	establish	criteria	for entrance into operational test	
In support of this, risk management measures and indicators, with associated thresholds, which address performance and technical adequacy of both hardware and software shall be defined and used on each program.	531	PM	establish	hardware criteria	for entrance into operational test	
	532	PM	establish	software criteria	for entrance into operational test	
A mission impact analysis of criteria and thresholds that have not been met shall be completed prior to certification for operational tests.	533	PM	analyze	impact on mission	of system operational test criteria not achieved	
3.4.4 Modeling and Simulation PMs shall integrate the use of modeling and simulation within program planning activities, plan for life cycle application, support, and reuse models and simulations, and integrate modeling and simulation across the functional disciplines.	534	PM	use	modeling and simulation		

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3.4.4 Modeling and Simulation — PMs shall integrate the use of modeling and simulation within program planning activities, plan for life cycle application, support, and reuse models and simulations, and integrate modeling and simulation across the functional disciplines.

3.4.5 Operational Test and Evaluation — Operational test and evaluation (OT&E) programs shall be structured to determine the operational effectiveness and suitability of a system under realistic conditions (e.g., combat) and to determine if the minimum acceptable operational performance requirements as specified in the ORD have been satisfied.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
535	PM	plan	modeling and simulation	for life cycle application	
536	PM	plan	modeling and simulation	for life cycle support	
537	PM	plan	modeling and simulation	for reuse	
538	PM	integrate	modeling and simulation	across functional disciplines	
539	PM	structure	OT&E	to determine operational effectiveness under realistic conditions	
540	PM	structure	OT&E	to determine operational suitability under realistic conditions	
541	PM	structure	OT&E	to determine if operational performance in ORD have been satisfied	

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
542	PM	use	threat or threat representative forces	in OT&E	
543	PM	use	threat or threat representative targets	in OT&E	
544	PM	use	threat countermeasures	in OT&E coordinated with DIA	
545	PM	use	typical users	to operate OT&E system	
546	PM	use	typical users	to operate OT&E system under stressful conditions	
547	PM	use	typical users	to operate OT&E system under peacetime conditions	
548	PM	use	production representative articles	for OT&E	
549	PM	consider	modeling and simulation	during OT&E planning	

3.4.5 Operational Test and Evaluation Threat or threat representative forces, targets, and threat countermeasures, validated in coordination with DIA, shall be used.

Typical users shall operate and maintain the system or item under conditions simulating combat stress and peacetime conditions.

The independent operational test activities shall use production or production representative articles for the dedicated phase of OT&E that supports the full-rate production decision, or for ACAT IA or other acquisition programs, the deployment decision.

The use of modeling and simulation shall be considered during test planning.

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3.4.5 Operational Test and Evaluation

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using	Statement
550	PM	evaluate	system performance capability	as opposed to documented plans	Using test and evaluation	as a condition for proceeding beyond LRIP, initial operational test and evaluation shall not comprise an operational assessment based exclusively on computer modeling; simulation; or, an analysis of system requirements, engineering proposals, design specifications, or any other information contained in program documents (10 USC 2399).
551	PM	document	modeling and simulation		TEMP	The extent of modeling and simulation usage in conjunction with operational and test evaluation shall be explained in the Test and Evaluation Master Plan (see 3.4.11).
552	PM	test	all hardware and software	after modification		All hardware and software alterations that materially change system performance (operational effectiveness and suitability) shall be adequately tested and evaluated. This includes system upgrades as well as changes made to correct deficiencies identified during test and evaluation.
553	PM	conduct	OT&E	prior to full-rate production		Conduct an OT&E before full-rate production to evaluate operational effectiveness and suitability as required by 10 USC 2399 for ACAT I and II programs.
554	PM	involve	testers			Operational Test Agencies shall participate early in program development to provide operational insights to the program office and to acquisition decisionmakers.
555	PM	use	training and exercise activities	during OT&E planning		Operational testing and evaluation shall be structured to take maximum advantage of training and exercise activities to increase the realism and scope of operational testing and to reduce testing costs.

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3.4.6 Operational Test and Evaluation Plans

Extracted Requirements

Statement	No.	Subject	Task	Object	Modifier	Using
The DOT&E shall approve, in writing, the adequacy of the OT&E plans (including project funding) for all ACAT I and ACAT IAM programs and other designated programs prior to the initiation of operational testing.	556	PM	obtain	DOT&E approval	for OT&E plans	
Plans for all operational assessments of programs on DOT&E's oversight list being conducted to support acquisition decisions such as LRIP or release of funds for long lead shall be approved by DOT&E prior to their execution.	557	PM	obtain	DOT&E approval	for operational assessments	
DoD Components shall brief the DOT&E on the concepts for the test and evaluation or assessment 120 days prior to commencement and submit the test plan to the DOT&E 60 days prior to commencement.	558	PM	brief	DOT&E	120 days prior to commencement of OT&E	
	559	PM	notify	DOT&E	60 days prior to commencement of OT&E	test plan
These test plans shall include test objectives, measures of effectiveness, planned operational scenarios, threat simulation, resources, test limitations, and methods of data gathering, reduction, and analysis.	560	PM	plan	test objectives		test plan
	561	PM	plan	MOE's		test plan
	562	PM	plan	operational scenarios		test plan
	563	PM	plan	threat simulation		test plan

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3.4.6 Operational Test and Evaluation Plans

These test plans shall include test objectives, measures of effectiveness, planned operational scenarios, threat simulation, resources, test limitations, and methods of data gathering, reduction, and analysis.

The planned test events shall be described in sufficient detail to permit an assessment of operational realism.

3.4.7 Use of System Contractors in Support of Operational Test and Evaluation

The use of system contractors in support of the OT&E conducted to support a decision to proceed beyond low-rate initial production is restricted by 10 USC 2399 .

3.4.8 Production Qualification Test and Evaluation

Production qualification test and evaluation shall be completed prior to the full rate production decision.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
564	PM	plan	resources		test plan
565	PM	plan	test limitations		test plan
566	PM	plan	methods of data gathering		test plan
567	PM	plan	methods of data reduction		test plan
568	PM	plan	methods of data analysis		test plan
569	PM	document	test plans	to allow assessment of operational realism	
570	PM	conduct	OT&E	IAW 10 USC 2399	
571	PM	conduct	production qualification test	prior to full-rate production	

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3.4.9. Live Fire Test and Evaluation

Live Fire Test and Evaluation (LFT&E), as that term is defined in 10 USC 2366 must be conducted on a covered system, major munition program, missile program, or product improvement to a covered system, major munition program, or missile program before it can proceed beyond low-rate initial production.

Survivability testing shall begin at the component, subsystem, and subassembly level, culminating with tests of the complete covered system or program, or covered product improvement, configured for combat.

Waivers and the use of alternative survivability and lethality testing shall be addressed in the TEMP for the covered system, program, or covered product improvement program. CAE certifications and reports required under 10 USC 2366(c) shall be submitted to Congress through the DOT&E and the USD(A&T).

Waivers and the use of alternative survivability and lethality testing shall be addressed in the TEMP for the covered system, program, or covered product improvement program.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
572	PM	conduct	LFT&E	prior to full-rate production	
573	PM	conduct	survivability testing	of components	
574	PM	conduct	survivability testing	of subsystems	
575	PM	conduct	survivability testing	of subassemplies	
576	PM	plan	waivers		TEMP
577	PM	plan	alternative survivability testing		TEMP
578	PM	plan	alternative lethality testing		TEMP

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Extracted Requirements

Statement	No.	Subject	Task	Object	Modifier	Using
3.4.9. Live Fire Test and Evaluation CAE certifications and reports required under 10 USC 2366(c) shall be submitted to Congress through the DOT&E and the USD(A&T).	579	PM	prepare	reports	IAW 10 USC 2366©	
	580	PM	submit	reports	to congress through DOT&E	
3.4.11 Test and Evaluation Master Plan The Test and Evaluation Master Plan (TEMP) shall focus on the overall structure, major elements, and objectives of the test and evaluation program that is consistent with the acquisition strategy.	581	PM	plan	overall test structure		TEMP
	582	PM	plan	major test elements		TEMP
	583	PM	plan	objectives of test and eval		TEMP
be prepared for all ACAT I and ACAT IA programs and other acquisition programs designated for DOT&E or Office of the Secretary of Defense test and evaluation oversight (10 USC 2399)	584	PM	plan	test and evaluation		TEMP
be approved by the DOT&E and the DTSE&E for all ACAT I and ACAT IAM programs and other designated programs	585	PM	obtain	approval		TEMP
provide a road map for integrated simulation, test, and evaluation plans, schedules, and resource requirements necessary to accomplish the test and evaluation program.	586	PM	integrate	simulation, T&E, schedules, and resource requirements		TEMP

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Extracted Requirements

	Statements	No.	Subject	Task	Object	Modifier	Using
3.5 Life Cycle Resource Estimates	For all ACAT I and IA programs, a life cycle cost estimate shall be prepared by the program office in support of program initiation (usually Milestone I) and all subsequent milestone reviews.	587	PM	prepare	life cycle cost estimate		
	For ACAT I programs, a manpower estimate shall be prepared by the Component's manpower authority in support of Milestone II and Milestone III.	588	PM	prepare	manpower		
	For ACAT I programs, the MDA may not approve entry into engineering and manufacturing development or production and deployment unless an independent estimate of the full life cycle cost of the program and a manpower estimate for the program have been completed and considered by the MDA (10 USC 2434).	589	PM	obtain	independent life cycle cost		
		590	PM	obtain	independent manpower estimates		
3.5.1 Life Cycle Cost Estimates	Explicitly based on the program objectives, operational requirements, contract specifications for the system, and, for ACAT I programs, a program DoD work breakdown structure (WBS) or, for ACAT IA programs, a life cycle cost and benefit element structure agreed upon by the IPT	591	PM	prepare	WBS		
	Comprehensive in character, identifying all elements of cost that would be entailed by a decision to proceed with development, production, and operation of the system regardless of funding source or management	592	PM	prepare	life cycle cost estimate	that is comprehensive	

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Extracted Requirements

		No.	Subject	Task	Object	Modifier	Using
3.5.1 Life Cycle Cost Estimates	For ACAT I programs, consistent with the cost estimates used in the analysis of alternatives, the manpower estimates behind the operation and support costs shall be consistent with the manpower estimate	593	PM	coordinate	cost estimates with manpower estimates		
	Neither optimistic nor pessimistic, but based on a careful assessment of risks and reflecting a realistic appraisal of the level of cost most likely to be realized.	594	PM	prepare	life cycle cost estimate	based on a careful assessment of risks	
		595	PM	prepare	life cycle cost estimate	reflecting a realistic appraisal of cost	
Cost Analysis Requirements Description (CARD)	For ACAT I programs, the DoD Component sponsoring the acquisition program shall establish, as a basis for the life cycle cost estimates, a description of the salient features of the acquisition program and of the system itself.	596	PM	establish	a description of the system		CARD
	(CARD), shall be given to the teams preparing the program office life cycle estimate, component cost estimate, and independent life cycle cost estimate 180 days in advance of a planned Overarching Integrated Product Team (OIPT) or Component review, unless another due date is agreed to by the OIPT.	597	PM	provide	a description of the system	to team preparing life cycle cost estimates 180 days prior to OIPT	CARD
	The CARD shall be flexible, tailored, and make reference to information available in other documents available to the cost estimators.	598	PM	provide	system information	that is tailored and refers to other documents	CARD
	For joint programs, the CARD shall include the common program as agreed to by all participating DoD Components as well as all unique program requirements of the participating DoD Components.	596	PM	establish	a description of the system		CARD

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Extracted Requirements

Cost Analysis Requirements Description (CARD)	No.	Subject	Task	Object	Modifier	Using CARD
For ACAT IA programs, the PM shall prepare the CARD in coordination with the appropriate IPT members.	600	PM	establish	a description of the system	using IPTs	
3.5.2 Manpower Estimates shall:						
Address whether the program is affordable from a military end strength and civilian work year perspective	601	PM	assess	program affordability	from a military end strength and civilian work year perspective	manpower estimate
Clearly state the risks associated with achieving manpower numbers reported in the estimate	602	PM	assess	manpower estimate risks	from a military end strength and civilian work year perspective	manpower estimate
Consider the program objectives, but shall base the estimate on a careful assessment of the risks and a realistic appraisal of the level of improvements most likely to be realized.	603	PM	assess	risks	using a realistic appraisal	manpower estimate
The manpower estimate shall report the total number of personnel needed to operate, maintain, support, and provide training for the program upon full operational deployment.	604	PM	determine	total personnel	to operate system	manpower estimate
	605	PM	determine	total personnel	to maintain system	manpower estimate
	606	PM	determine	total personnel	to support system	manpower estimate
	607	PM	determine	total personnel	to provide training for the system	manpower estimate

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Extracted Requirements

3.5.2 Manpower Estimates shall:

It shall report the number of military (officer, warrant officer, and enlisted), DoD civilian, and contract manpower requirements for each fiscal year of the program beginning with initial fielding and ending with full operational deployment.

A separate estimate shall be provided for each Component (for joint programs) and separately for the Active, Reserve, and National Guard forces.

No.	Subject	Task	Object	Modifier	Using
608	PM	determine	total personnel	that are officer per fiscal year from initial fielding to full operational deployment	manpower estimate
609	PM	determine	total personnel	that are warrant officer per fiscal year from initial fielding to full operational deployment	manpower estimate
610	PM	determine	total personnel	that are enlisted per fiscal year from initial fielding to full operational deployment	manpower estimate
611	PM	determine	total personnel	that are DoD civilian per fiscal year from initial fielding to full operational deployment	manpower estimate
612	PM	determine	total personnel	that are contractor per fiscal year from initial fielding to full operational deployment	manpower estimate
613	PM	determine	total personnel	for each component	manpower estimate

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
614	PM	determine	total personnel	for active forces	manpower estimate
615	PM	determine	total personnel	for reserve forces	manpower estimate
616	PM	determine	total personnel	for National Guard forces	manpower estimate
617	PM	determine	total personnel	as military end-strengths	manpower estimate
618	PM	determine	total personnel	as civilian work years	manpower estimate
619	PM	determine	resource shortfalls		manpower estimate
620	PM	evaluate	manpower	against FYDP	manpower estimate

3.5.2 Manpower Estimates shall:

A separate estimate shall be provided for each Component (for joint programs) and separately for the Active, Reserve, and National Guard forces.

The estimate shall report manpower requirements and authorizations (as military end-strengths and civilian work years) for each fiscal year, and shall indicate if there are any resource shortfalls for any fiscal year covered in the report.

The report shall state whether any increase in military end strengths or civilian work years (beyond what is included in the Future Years Defense Program) or whether waivers to existing manpower constraints will be required to support full operational deployment of the system.

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Extracted Requirements

	Statement	No.	Subject	Task	Object	Modifier	Using
3.5.2 Manpower Estimates shall:	The report shall also address whether the manpower requirements represent an increase over what was required for the predecessor (replaced) system(s), as appropriate, and whether the manpower objectives and thresholds in the ORD, if established, were met or exceeded.	621	PM	evaluate	manpower	against predecessor system	manpower estimate
		622	PM	evaluate	manpower	against ORD values	manpower estimate
4.2 Integrated Product and Process Development	The PM shall employ the concept of Integrated Product and Process Development (IPPD) throughout the program design process to the maximum extent practicable.	623	PM	use	IPPD		IPPD
	The IPPD management process shall integrate all activities from product concept through production and field support, using multidisciplinary teams to simultaneously optimize the product and its manufacturing and supportability to meet cost and performance objectives.	624	PM	integrate	system functions	from product concept through field support	IPPD
		625	PM	use	multidisciplinary teams		IPPD
		626	PM	use	concurrent optimization	of manufacturing and supportability against cost and performance	IPPD
4.3 Systems Engineering	The Program Manager shall ensure that a systems engineering process is used to translate operational needs and/or requirements into a system solution that includes the design, manufacturing, test and evaluation, and support processes and products.	627	PM	use	process		systems engineering

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4.3 Systems Engineering

The systems engineering process shall establish a proper balance between performance, risk, cost, and schedule, employing a top-down iterative process of requirements analysis, functional analysis and allocation, design synthesis and verification, and system analysis and control.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
628	PM	balance	cost, schedule, performance and risk		systems engineering
629	PM	use	top down design process		systems engineering
630	PM	use	iterative design process		systems engineering
631	PM	use	requirements analysis		systems engineering
632	PM	use	functional analysis and allocation		systems engineering
633	PM	use	design synthesis		systems engineering
634	PM	use	design verification		systems engineering
635	PM	use	system analysis		systems engineering
636	PM	use	control		systems engineering

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4.3 Systems Engineering

Transform operational needs and requirements (reference Appendix II) into an integrated system design solution through concurrent consideration of all life cycle needs (i.e., development, manufacturing, test and evaluation, verification, deployment, operations, support, training and disposal).

Ensure the compatibility, interoperability and integration of all functional and physical interfaces and ensure that system definition and design reflect the requirements for all system elements: hardware, software, facilities, people, and data

Characterize and manage technical risks.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
637	PM	use	concurrent optimization		systems engineering
638	PM	ensure	compatibility	of all functional and physical interfaces	systems engineering
639	PM	ensure	interoperability	of all functional and physical interfaces	systems engineering
640	PM	ensure	integration	of all functional and physical interfaces	systems engineering
641	PM	define	system	for all system elements (hardware, software, facilities, people, and data)	systems engineering
642	PM	characterize	risks		systems engineering
643	PM	manage	risks		systems engineering

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Extracted Requirements

Statement	No.	Subject	Task	Object	Modifier	Using
Requirements Analysis. Throughout the acquisition process the program office shall work with the user to establish and refine operational and design requirements that result in the proper balance between performance and cost within affordability constraints.	644	PM	involve	user		systems engineering
Requirements analysis shall be conducted iteratively with functional analysis/allocation to develop and refine system level functional and performance requirements, external interfaces and provide traceability among user requirements and design requirements.	630	PM	use	iterative design process		systems engineering
	646	PM	develop	system level functional and performance requirements		systems engineering
	647	PM	develop	external interfaces		systems engineering
	648	PM	provide	traceability	between user requirements and design requirements	systems engineering
Functional Analysis/Allocation Functional analysis/allocation shall be performed iteratively to define successively lower level functional and performance requirements, including functional interfaces and architecture.	629	PM	use	top down design process		systems engineering
	630	PM	use	iterative design process		systems engineering

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Extracted Requirements

	No.	Subject	Task	Object	Modifier	Using
Functional Analysis/Allocation — Functional analysis/allocation shall be performed iteratively to define successively lower level functional and performance requirements, including functional interfaces and architecture.	651	PM	define	functional interfaces		systems engineering
	652	PM	define	functional architecture		systems engineering
Functional and performance requirements shall be traceable to higher level requirements.	653	PM	provide	traceability	from functional and performance requirements to higher level requirements	systems engineering
System requirements shall be allocated and defined in sufficient detail to provide design and verification criteria to support the integrated system design.	654	PM	allocate	requirements	to functions	systems engineering
	655	PM	define	requirements	in sufficient detail for design and verification criteria	systems engineering
Design Synthesis and Verification. Design synthesis and verification activities shall translate functional and performance requirements into design solutions to include: alternative people, product and process concepts and solutions, and internal and external interfaces.	633	PM	use	design synthesis		systems engineering
	657	PM	translate	requirements	into alternative people concepts and	systems engineering

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Design Synthesis and Verification.

Design synthesis and verification activities shall translate functional and performance requirements into design solutions to include: alternative people, product and process concepts and solutions, and internal and external interfaces.

These design solutions shall be in sufficient detail to verify requirements have been met.

The verification of the design shall include a cost-effective combination of design analysis, design modeling and simulation, and demonstration and testing.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
658	PM	translate	requirements	into alternative product concepts and solutions	systems engineering
659	PM	translate	requirements	into alternative process concepts and solutions	systems engineering
660	PM	translate	requirements	into internal and external interfaces	systems engineering
661	PM	define	design solutions	in sufficient detail for verification	systems engineering
662	PM	verify	design	design analysis	systems engineering
663	PM	verify	design	design modeling and simulation	systems engineering
664	PM	verify	design	design demonstration	systems engineering
665	PM	verify	design	design testing	systems engineering

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Extracted Requirements

Applicable DoD 5000.2R Statements		No.	Subject	Task	Object	Modifier	Using
Design Synthesis and Verification.	The verification process shall address the design tools, products, and processes.	666	PM	verify	design tools		systems engineering
		667	PM	verify	products		systems engineering
		668	PM	verify	processes		systems engineering
System Analysis and Control	System analysis and control activities shall be established to serve as a basis for evaluating and selecting alternatives, measuring progress, and documenting design decisions. This shall include:	635	PM	use	system analysis		systems engineering
		636	PM	use	control		systems engineering
	The conduct of trade-off studies among requirements (operational, functional and performance), design alternatives and their related manufacturing, testing and support processes, program schedule and life cycle cost at the appropriate level of detail to support decision-making and lead to a proper balance between performance and cost.	671	PM	conduct	trade-off analyses		systems engineering
	The establishment of a risk management process to be applied throughout the design process.	672	PM	establish	risk management process		systems engineering

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System Analysis and Control	The risk management effort shall address the identification and evaluation of potential sources of technical risks based on the technology being used and its related design, manufacturing capabilities, potential industry sources, test and support processes, risk mitigation efforts, and risk assessment and analysis.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
673	PM	identify	risk	based on technology	systems engineering
674	PM	identify	risk	design	systems engineering
675	PM	identify	risk	manufacturing capabilities	systems engineering
676	PM	identify	risk	potential industry sources	systems engineering
677	PM	identify	risk	test processes	systems engineering
678	PM	identify	risk	support processes	systems engineering
679	PM	identify	risk	rist mitigation efforts	systems engineering
680	PM	identify	risk	risk assessment	systems engineering
681	PM	identify	risk	risk analysis	systems engineering

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System Analysis and Control

The risk management effort shall address the identification and evaluation of potential sources of technical risks based on the technology being used and its related design, manufacturing capabilities, potential industry sources, test and support processes, risk mitigation efforts, and risk assessment and analysis.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
682	PM	evaluate	risk	based on technology	systems engineering
683	PM	evaluate	risk	design	systems engineering
684	PM	evaluate	risk	manufacturing capabilities	systems engineering
685	PM	evaluate	risk	potential industry sources	systems engineering
686	PM	evaluate	risk	test processes	systems engineering
687	PM	evaluate	risk	support processes	systems engineering
688	PM	evaluate	risk	rist mitigation efforts	systems engineering
689	PM	evaluate	risk	risk assessment	systems engineering
690	PM	evaluate	risk	risk analysis	systems engineering

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
System Analysis and Control					
691	PM	establish	technology transition	criteria	systems engineering
692	PM	plan	technology transition		systems engineering
693	PM	use	configuration management	for system products	systems engineering
694	PM	use	configuration management	for system processes	systems engineering
695	PM	use	configuration management	for related documentation	systems engineering
696	PM	use	configuration management	for complete audit trail of decisions	systems engineering
697	PM	use	configuration management	for complete audit trail of design	systems engineering
698	PM	establish	integrated data management system	to capture the technical baseline	systems engineering

System Analysis and Control

Technology transition planning and criteria shall be established as part of the overall risk management

A configuration management process to control the system products, processes and related documentation.

It shall provide a complete audit trail of decisions and design modifications.

An integrated data management system to capture and control the technical baseline (configuration documentation, technical data, and technical manuals); provide data correlation and traceability among requirements, designs, decisions, rationale, and other related program planning, and reporting, support configuration procedures, and serve as a ready reference for the systems engineering effort.

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System Analysis and Control

An integrated data management system to capture and control the technical baseline (configuration documentation, technical data, and technical manuals); provide data correlation and traceability among requirements, designs, decisions, rationale, and other related program planning, and reporting, support configuration procedures, and serve as a ready reference for the systems engineering effort.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
699	PM	establish	integrated data management system	to control the technical baseline	systems engineering
700	PM	establish	integrated data management system	to provide data correlation	systems engineering
701	PM	establish	integrated data management system	for traceability among requirements	systems engineering
702	PM	establish	integrated data management system	for traceability among designs	systems engineering
703	PM	establish	integrated data management system	for traceability among decisions	systems engineering
704	PM	establish	integrated data management system	for traceability among rationale	systems engineering
705	PM	establish	integrated data management system	for other related program planning	systems engineering

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Extracted Requirements

	Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
System Analysis and Control	An integrated data management system to capture and control the technical baseline (configuration documentation, technical data, and technical manuals); provide data correlation and traceability among requirements, designs, decisions, rationale, and other related program planning, and reporting, support configuration procedures, and serve as a ready reference for the systems engineering effort.	706	PM	establish	integrated data management system	for reporting	systems engineering
		707	PM	establish	integrated data management system	to support configuration management	systems engineering
		708	PM	establish	integrated data management system	serve as ready reference for systems engineering	systems engineering
	PMs shall use existing information systems and data formats rather than DoD-unique systems and formats provided they can readily meet the program's information requirements and do not pose compatibility issues with operational DoD information systems and data.	709	PM	use	existing information systems		
		710	PM	use	existing data formats		
1.4.3 Phase I: Program Definition and Risk Reduction	Assessments of the advantages and disadvantages of alternative concepts shall be refined.	045	PM	assess	concept(s) advantages / disadvantages		

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1.4.3 Phase I: Program Definition and Risk Reduction

Prototyping, demonstrations, and early operational assessments shall be considered and included as necessary to reduce risk so that technology, manufacturing, and support risks are well in hand before the next decision point.

Cost drivers, life cycle cost estimates, cost-performance trades, interoperability, and acquisition strategy alternatives shall be considered to include evolutionary and incremental software

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
046	PM	perform	prototyping	as necessary	
047	PM	perform	demonstrations	as necessary	
048	PM	perform	early operational assessments	as necessary	
049	PM	consider	cost-drivers		
050	PM	consider	life cycle cost estimates		
051	PM	consider	cost-performance trades		
052	PM	consider	interoperability		
053	PM	consider	acquisition strategy alternatives		

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1.4.3 Phase I: Program Definition and Risk Reduction

Cost drivers, life cycle cost estimates, cost-performance trades, interoperability, and acquisition strategy alternatives shall be considered to include evolutionary and incremental software

System Analysis and Control

The establishment of performance metrics to provide measures of how well the technical development and design are evolving relative to what was planned and relative to meeting system requirements in terms of performance, risk mitigation, producibility, cost and schedule.

Performance metrics must be traceable to performance parameters identified by the operational user.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
054	PM	consider	evolutionary software development		
055	PM	consider	incremental software development		
711	PM	establish	performance metrics	performance	
712	PM	establish	performance metrics	risk mitigation	
713	PM	establish	performance metrics	producibility	
714	PM	establish	performance metrics	cost	
715	PM	establish	performance metrics	schedule	
716	PM	establish	performance metrics	based on parameters identified by user	

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Extracted Requirements

	Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
System Analysis and Control	The establishment of interface controls to ensure all internal and external interface requirement changes are properly recorded and communicated to all affected configuration items.	717	PM	establish	interface controls	for internal and external interfaces requirement changes	
	A structured review process to demonstrate and confirm completion of required accomplishments and their exit criteria as defined in program planning.	718	PM	establish	review process		
		719	PM	establish	review exit criteria		
	Reviews necessary to demonstrate, confirm, and coordinate progress shall be incorporated into overall program planning.	720	PM	establish	review process	to demonstrate progress	
		721	PM	establish	review process	to confirm progress	
		722	PM	establish	review process	to coordinate progress	
4.3.1 Manufacturing and Production	The producibility of the system design shall be a priority of the development effort.	723	PM	consider	producibility of the design		
	Design engineering efforts shall focus on concurrent development of producible designs, capable manufacturing processes, and process controls to ensure requirements satisfaction and minimize manufacturing costs.	724	PM	use	concurrent design process	for designs	

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Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
4.3.1 Manufacturing and Production						
Design engineering efforts shall focus on concurrent development of producible designs, capable manufacturing processes, and process controls to ensure requirements satisfaction and minimize manufacturing costs.	725	PM	use	concurrent design process	for manufacturing processes	
	726	PM	use	concurrent design process	for process controls	
The use of existing manufacturing processes shall be capitalized upon whenever possible.	727	PM	use	existing manufacturing processes		
When new manufacturing capabilities are required, flexibility (i.e., insensitivity to rate and product configuration) shall be considered.	728	PM	consider	flexible manufacturing processes		
Full rate production of a system shall not be approved until the system's design has been stabilized, the manufacturing processes have been proven, and the production facilities and equipment are in place (or are being put in place).	729	PM	stabilize	design	prior to full rate production	
	730	PM	prove	manufacturing processes	prior to full rate production	
	731	PM	organize	production facilities and equipment	prior to full rate production	

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Extracted Requirements

4.3.2 Quality

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
The PM shall allow contractors the flexibility to define and use their preferred quality management process that meets program objectives.	732	PM	use	contractor's quality management process	if meets program objectives	
Third party certification or registration of a supplier's quality system shall not be required.	733	PM	accept	quality certification	second party	
The quality management process shall include Monitoring and control of critical processes and product variation	734	PM	establish	quality management process	monitor and control critical processes	
	735	PM	establish	quality management process	monitor and control product variation	
The quality management process shall include Establishment of mechanisms for feedback of field product performance	736	PM	establish	quality feedback mechanisms	from field use	
The quality management process shall include Implementation of an effective root cause analysis and corrective action system	737	PM	establish	quality management process	root cause analysis	
	738	PM	establish	quality management process	corrective action system	
The quality management process shall include Continuous process improvement.	739	PM	establish	quality management process	continuous process improvement	

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Extracted Requirements

		Statement	No.	Subject	Task	Object	Modifier	Using
4.3.3 Acquisition Logistics		The PM shall conduct acquisition logistics management activities throughout the system development to ensure the design and acquisition of systems that can be cost-effectively supported and to ensure that:these systems are provided to the user with the necessary support infrastructure for achieving the user's peacetime and wartime readiness requirements.	740	PM	conduct	acquisition logistics management		Using
4.3.3.1 Supportability Analyses		Supportability analyses shall be conducted as an integral part of the systems engineering process beginning at program initiation and continuing throughout program development.	741	PM	conduct	supportability analysis		systems engineering
		Supportability analyses shall form the basis for related design requirements included in the system specification and for subsequent decisions concerning how to most cost-effectively support the system over its entire life cycle.	742	PM	establish	requirements	based on supportability analysis	systems engineering
1.4.4.1 Low Rate Initial Production		The LRIP quantity shall not be less than one unit and any increase shall be approved by the MDA.	059	Both	plan	LRIP quantities	>= 1 unit	
			060	MDA	approve	LRIP quantities increases		
		When approved LRIP quantities are expected to be exceeded because the program has not yet demonstrated readiness to proceed to full-rate production, the MDA shall assess the cost and benefits of a break in production versus annual buys.	061	MDA	assess	break in production	when LRIP quantities expect to be	
4.3.3.1 Supportability Analyses		Programs shall allow contractors the maximum flexibility in proposing the most appropriate supportability analyses.	743	PM	use	contractor's supportability analysis		

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Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
4.3.3.2 Support Concepts	Acquisition programs shall establish logistics support concepts (e.g., two level, three level) early in the program and refine them throughout the development process.	744	PM	establish	logistic support concepts		
	Life cycle costs shall play a key role in the overall selection process.	745	PM	use	life cycle costs	to make decisions	
	Support concepts for new and future weapon systems shall provide for cost effective total life cycle logistics support.	746	PM	define	support concepts	to make total life cycle logistics support cost effective	
4.3.3.3 Support Data	Data requirements shall be consistent with the planned support concept and represent the minimum essential to effectively support the fielded system.	747	PM	obtain	support data	consistent with planned support concept	
		748	PM	obtain	support data	minimum essential to support fielded system	
	Government requirements for contractor developed support data shall be coordinated with the data requirements of other program functional specialties to minimize data redundancies and inconsistencies.	749	PM	coordinate	support data	minimum essential for all functions	
4.3.3.4 Support Resources	Support resources such as operator and maintenance manuals, tools, support equipment, training devices, etc. for major weapon system components shall not be procured before the weapon system/component hardware and software design stabilizes.	750	PM	procure	support resources	after system design stabilizes	
		751	PM	procure	operator manuals	after system design stabilizes	

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4.3.3.4 Support Resources

Support resources such as operator and maintenance manuals, tools, support equipment, training devices, etc. for major weapon system components shall not be procured before the weapon system/component hardware and software design stabilizes.

The PM shall consider the use of embedded training and maintenance techniques to enhance user capability and reduce life cycle costs.

Where they are available, cost-effective, and can readily meet the user's requirements, commercial support resources shall be used.

DoD automatic test system (ATS) families or COTS components that meet defined ATS capabilities shall be used to meet all acquisition needs for automatic test equipment hardware and software.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
752	PM	procure	maintenance manuals	after system design stabilizes	
753	PM	procure	tools	after system design stabilizes	
754	PM.	procure	support equipment	after system design stabilizes	
755	PM	procure	training devices	after system design stabilizes	
756	PM	consider	embedded training/maintenance		
757	PM	use	commercial support resources		
758	PM	use	DOD ATS families	for ATE	
759	PM.	use.	COTS components	for ATE	

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4.3.3.4 Support Resources

ATS capabilities shall be defined through critical hardware and software elements.

The introduction of unique types of ATS into the DoD field, depot, and manufacturing operations shall be minimized, and the selection shall be based on a cost and benefit analysis that ensures that the ATS chosen is the most beneficial to the DoD over the system life

4.3.4 Open Systems Design

PMs shall address the use of open standards in the design of all systems elements (mechanical, electrical, software, etc.).

The design effort shall select open standards for interfaces based on the criteria described in the open systems strategy (see 3.3.1).

Selected interfaces shall be controlled by standards adopted by recognized standards organizations whenever possible.

When these standards are not effective, de facto standards (set by the market place) shall be used.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
760	PM	define	ATS capabilities	through critical hardware and software elements	
761	PM	analyze	automated test equipment requirements		cost/benefit analysis
762	PM	assess	open standards	all system elements	
763	PM	assess	open standards	mechanical	
764	PM	assess	open standards	electrical	
765	PM	assess	open standards	software	
766	PM	select	open standards	based on open systems strategy	
767	PM	use	open standards	standards organization based	
768	PM	use	open standards	market based	

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Extracted Requirements

Section	Statement	No.	Subject	Task	Object	Modifier	Using
4.3.4 Open Systems Design	PMs shall document means for assuring conformance to open standards.	769	PM	plan	open standards	conformance	
4.3.5 Software Engineering	Software shall be managed and engineered using best processes and practices that are known to reduce cost, schedule, and performance risks.	770	PM	use	best practices	for software management	
		771	PM	use	best practices	for software engineering	
	It is DoD policy to design and develop software systems based on systems engineering principles (CCA)	772	PM	develop	software		systems engineering
1.4.5.1 Operational Support	This activity shall also include the execution of operational support plans, to include the transition from contractor to organic support, if appropriate.	070	PM	plan	operational support	as appropriate	operational support plan
		071	PM	plan	transition from contractor to organic support	as appropriate	operational support plan
4.3.6 Reliability, Maintainability and Availability	The PM shall ensure that reliability, maintainability, and availability activities are established early in the acquisition cycle to assure meeting operational requirements and reduced life cycle ownership cost.	773	PM	plan	reliability activities		
		774	PM	plan	maintainability activities		
		775	PM	plan	availability activities		

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4.3.6 Reliability, Maintainability and Availability
The PM shall plan and execute reliability, maintainability, and availability design, manufacturing development and test activities such that equipment used to demonstrate system performance prior to production reflects the mature design.

4.3.7 Environment, Safety, and Health
All programs, regardless of acquisition category, shall comply with this section and be conducted in accordance with applicable federal, state, interstate, and local environmental laws and regulations, Executive Orders (EOs), treaties, and agreements.

Extracted Requirements

No.	Subject	Task	Object	Modifier for performance verification	Using
776	PM	use	mature system		
777	PM	comply	federal laws and regulations		
778	PM	comply	state laws and regulations		
779	PM	comply	interstate laws and regulations		
780	PM	comply	local environmental laws and regulations		
781	PM	comply	Executive Orders		
782	PM	comply	treaties		
783	PM	comply	agreements		

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
4.3.7 Environment, Safety, and Health — The PM shall ensure that the system can be tested, operated, maintained, and repaired in compliance with environmental regulations and the requirements of this section.					
784	PM	ensure	system testing	IAW environmental regulations	
785	PM	ensure	system operation	IAW environmental regulations	
786	PM	ensure	system maintenance	IAW environmental regulations	
787	PM	ensure	system repair	IAW environmental regulations	
Environmental, safety, and health (ESH) analyses shall be conducted, as described below, to integrate ESH issues into the systems engineering process and to support development of the Programmatic ESH Evaluation (see 3.3.7).					
788	PM	analyze	ESH		
4.3.7.1 National Environmental Policy Act — The PM shall comply with the National Environmental Policy Act (NEPA) (42 USC 4321-4370d), implementing regulations (40 CFR 1500-1508), and executive orders (EO 12114 and EO 11514) by analyzing actions proposed to occur in upcoming program phases that may require NEPA or EO analysis					
789	PM	analyze	all actions	that may require NEPA or EO analysis	
and providing the MDA with milestones and status for each planned analysis.					
790	PM	plan	analyses	and update MDA	

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4.3.7.2 Environmental Compliance

To minimize the cost and schedule risks that changing regulations represent, the PM shall regularly review environmental regulations and shall analyze the regulations and evaluate their impact on the program's cost, schedule, and performance.

4.3.7.3 System Safety and Health

The PM shall identify and evaluate system safety and health hazards, define risk levels, and establish a program that manages the probability and severity of all hazards associated with development, use, and disposal of the system.

All safety and health hazards shall be managed consistent with mission requirements and shall be cost-effective.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
791	PM	analyze	current environmental regulations	repeatedly	
792	PM	evaluate	current environmental regulations	impact on program cost, schedule and performance	
793	PM	identify	system safety and health hazards		
794	PM	evaluate	system safety and health hazards		
795	PM	establish	safety and health management program	for development, use and disposal	
796	PM	balance	safety and health hazards	with mission requirements	
797	PM	ensure	safety and health management program	is cost-effective	

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4.3.7.4 Hazardous Materials

The PM shall establish a hazardous material management program that ensures appropriate consideration is given to eliminating and reducing the use of hazardous materials in processes and products rather than simply managing pollution created (EO 12856).

The selection, use, and disposal of hazardous materials shall be evaluated and managed considering environmental, safety, and health factors so that the DoD incurs the lowest cost required to protect human health and the environment over the system's life cycle, consistent with the program's cost, schedule, and performance goals.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
798	PM	establish	hazardous material management program	focused on materials used	
799	PM	evaluate	selection of hazardous materials	to minize cost to DoD	
800	PM	evaluate	use of hazardous materials	to minize cost to DoD	
801	PM	evaluate	disposal of hazardous materials	to minize cost to DoD	
802	PM	manage	selection of hazardous materials	to minize cost to DoD	
803	PM	manage	use of hazardous materials	to minize cost to DoD	
804	PM	manage	disposal of hazardous materials	to minize cost to DoD	

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4.3.7.4 Hazardous Materials

Where a hazardous material use cannot be avoided, the PM shall develop and implement plans and procedures for identifying, minimizing use of, tracking, storing, handling, packaging, transporting, and disposing of such materials and equipment.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
805	PM	plan	identification procedures	for hazardous materials that must be used	
806	PM	plan	minimizing use procedures	for hazardous materials that must be used	
807	PM	plan	tracking procedures	for hazardous materials that must be used	
808	PM	plan	storing procedures	for hazardous materials that must be used	
809	PM	plan	handling procedures	for hazardous materials that must be used	
810	PM	plan	packaging procedures	for hazardous materials that must be used	
811	PM	plan	transporting procedures	for hazardous materials that must be used	

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Extracted Requirements

Applicable DoD 5000.2R Statements	No.	Subject	Task	Object	Modifier	Using
4.3.7.4 Hazardous Materials — Where a hazardous material use cannot be avoided, the PM shall develop and implement plans and procedures for identifying, minimizing use of, tracking, storing, handling, packaging, transporting, and disposing of such materials and equipment.	812	PM	plan	disposal procedures	for hazardous materials that must be used	
As new technology becomes available, the PM shall replace hazardous materials in the system through changes in the system design, manufacturing, and maintenance processes, where technically and economically practical.	813	PM	replace	hazardous material	through design, manufacturing and maintenance technologies	
To minimize costs, the PM whenever possible shall work with the contractor and other PMs in identifying and testing mutually acceptable alternatives.	814	PM	coordinate	investigations of alternative materials	with contractors and other PMs	
4.3.7.5 Pollution Prevention — In designing, manufacturing, testing, operating, maintaining, and disposing of systems, all forms of pollution shall be prevented or reduced at the source whenever feasible.	815	PM	reduce	pollution	at the source	
Pollution that cannot be prevented shall be recycled in an environmentally safe manner.	816	PM	recycle	pollution	in an environmentally safe manner	
Pollution that cannot be prevented or recycled shall be treated in an environmentally safe manner.	817	PM	treat	pollution	in an environmentally safe manner	
Disposal or other releases to the environment shall be employed only as a last resort and must be conducted in an environmentally safe manner.	818	PM	release	pollution	in an environmentally safe manner	

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4.3.7.5 Pollution Prevention

The PM shall establish a pollution prevention program to help minimize environmental impacts and the life cycle costs associated with environmental compliance.

The PM shall identify the following: the impacts of the system on the environment, actions needed to prevent or control the impacts, the types and amounts of pollution that will be released to the environment, ESH risks associated with using new technologies, and other information needed to identify source reduction and recycling opportunities.

In developing work statements, specifications, and other product descriptions, EO 12873 requires PMs to eliminate the use of virgin material requirements as practicable, and consider use of recovered materials, reuse of products, life cycle cost, recyclability, use of environmentally preferable products, waste prevention (including toxicity reduction or elimination), and ultimately, disposal, as appropriate (see FAR 11.301).

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
819	PM	establish	pollution prevention program	minimize environmental impact and cost	
820	PM	identify	impacts of system on environment		
821	PM	identify	actions needed to prevent/ control impact		
822	PM	identify	type and amount of pollution		
823	PM	identify	ESH risks of new technologies		
824	PM	identify	other information		
825	PM	evaluate	specs	to eliminate virgin material requirements	

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4.3.7.5 Pollution Prevention

In developing work statements, specifications, and other product descriptions, EO 12873 requires PMs to eliminate the use of virgin material requirements as practicable, and consider use of recovered materials, reuse of products, life cycle cost, recyclability, use of environmentally preferable products, waste prevention (including toxicity reduction or elimination), and ultimately, disposal, as appropriate (see FAR 11.301).

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
826	PM	evaluate	specs	to consider use of recovered materials	
827	PM	evaluate	specs	to consider reuse of products	
828	PM	evaluate	specs	to consider life cycle cost	
829	PM	evaluate	specs	to consider recyclability	
830	PM	evaluate	specs	to consider use of environmentally preferable products	
831	PM	evaluate	specs	to consider use of waste prevention	
832	PM	evaluate	specs	to consider waste disposal	

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4.3.8 Human Systems Integration (HSI)

A comprehensive management and technical strategy for human systems integration shall be initiated early in the acquisition process to ensure that: human performance; the burden the design imposes on manpower, personnel, and training (MPT); and safety and health aspects are considered throughout the system design and development processes.

Human factors engineering requirements shall be established to develop effective human-machine interfaces, and minimize or eliminate system characteristics that require extensive cognitive, physical, or sensory skills; require excessive training or workload for intensive tasks; or result in frequent or critical errors or safety/health hazards.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
833	PM	ensure	requirements	include human performance aspects	
834	PM	ensure	requirements	include the burden the design imposes on MPT	
835	PM	ensure	requirements	include safety and health aspects	
836	PM	ensure	requirements	include effective human-machine interfaces	
837	PM	ensure	requirements	include limiting cognitive, physical or sensory skills	
838	PM	ensure	requirements	include limiting excessive training or workload	
839	PM	ensure	requirements	include frequent or critical errors or hazards	

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Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
840	PM	identify	capabilities	of the operator	
841	PM	identify	capabilities	of the trainer	
842	PM	identify	capabilities	of the maintainer	
843	PM	identify	capabilities	of the other support personnel	
844	PM	structure	interfaces	IAW JTA	
844	PM	structure	interfaces	IAW JTA	
846	PM	structure	C4I interfaces	IAW DODD 4630.5, DODI 4630.8, CJCSI 6212.01A	
847					

4.3.8 Human Systems Integration (HSI)

The capabilities and limitations of the operator, maintainer, trainer, and other support personnel shall be identified prior to program initiation (usually Milestone I), and refined during the development process.

Human-machine interfaces shall comply with the mandatory guidelines for all C4I systems, automated information systems, and weapons systems that must interface with C4I systems or automated information systems, as defined in the DoD Joint Technical Architecture (JTA).

4.3.9 Interoperability

The DoD JTA is mandatory for all emerging systems and systems upgrades.

Interoperability of C4I Systems shall be in compliance with DoDD 4630.5, DoDI 4630.8, and CJCSI 6212.01A. (CCA and PRA)

4.4 Other Design Considerations

Applicable DoD 5000.2R Statements

Extracted Requirements

	No.	Subject	Task	Object system	Modifier	Using
4.4.1 Survivability — System (to include the crew) survivability from all threats found in the various levels of conflict shall be considered and fully assessed as early as possible in the program, usually during Phase I.	848	PM	assess		from all threats	
4.4.2 Work Breakdown Structure — A program work breakdown structure (WBS) shall be established that provides a framework for program and technical planning, cost estimating, resource allocations, performance measurements, and status reporting.	849	PM	use	WBS	for program planning	
	850	PM	use	WBS	for technical planning	
	851	PM	use	WBS	for cost estimating	
	852	PM	use	WBS	for resource allocations	
	853	PM	use	WBS	for performance measurements	
	854	PM	use	WBS	for status reporting	
Program offices shall tailor a program WBS for each program using the guidance in MIL-HDBK-881.	855	PM	tailor	WBS	using MIL-HDBK-881	
4.4.3 Standardization Documentation — Preference shall be given to specifications and standards developed under the Defense Standardization Program.	856	PM	use	specs	from Defense Standardization Program	

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Applicable DoD 5000.2R Statements

Extracted Requirements

Section / Statement	No.	Subject	Task	Object	Modifier	Using
4.4.4 Metric System — The metric system of measurement shall be used for all elements of defense systems requiring new design, unless waived by the MDA as not in the best interest of the government (15 USC 205a-205k , and EO 12770).	857	PM	use	metric system		
4.4.5 Program Protection — Acquisition programs shall identify elements of the program, classified or unclassified, that require protection to prevent unauthorized disclosure or inadvertent transfer of critical program technology or information.	858	PM	identify	sensitive program elements	to prevent inadvertent transfer of technology	
Program protection planning shall begin early in the acquisition life cycle and be updated as required.	859	PM	plan	program protection		
The planning process shall incorporate risk management and threat-based countermeasures to provide cost-effective protection.	860	PM	plan	program protection	to include risk management	
	861	PM	plan	program protection	to include threat-based countermeasures	
4.4.6 Information Assurance — Information systems shall be managed and engineered using best processes and practices that are known to reduce security risks, including the risks to timely accreditation.	862	PM	plan	information systems	to reduce security risks	
	863	PM	plan	information systems	to reduce risk to timely accreditation	

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Applicable DoD 5000.2R Statements

4.4.6 Information Assurance

Information assurance requirements shall be included as part of program and systems design activities to ensure availability, integrity, authentication, confidentiality, and non-repudiation of critical program technology and information.

All AISs shall meet security requirements in accordance with DoDD 5200.28 and be accredited by the Designated Approving Authority prior to processing classified or sensitive unclassified data.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
864	PM	develop	requirements	to include information assurance requirements	
865	PM	develop	requirements	to include availability of critical program tech and info	
866	PM	develop	requirements	to include integrity of critical program tech and info	
867	PM	develop	requirements	to include authentication of critical program tech and info	
868	PM	develop	requirements	to include confidentiality of critical program tech and info	
869	PM	develop	requirements	to include non-repudiation of critical program tech	
870	PM	develop	AIS	IAW DODD 5200.28	

Applicable DoD 5000.2R Statements

Extracted Requirements

	Statement	No.	Subject	Task	Object	Modifier	Using
4.4.6 Information Assurance	All AISs shall meet security requirements in accordance with DoDD 5200.28 and be accredited by the Designated Approving Authority prior to processing classified or sensitive unclassified data.	871	PM	accredit	AIS	using Designated Approving Authority	
4.4.7 Electromagnetic Environmental Effects (E3) and Spectrum Management	All electric or electronic systems shall be designed to be mutually compatible with other electric or electronic equipment within their expected operational environment.	872	PM	develop	requirements	for mutual compatibility of electric and electronic equip	
	Systems and equipment that emit or receive hertzian waves shall comply with OMB Circular A-11 to determine spectrum supportability prior to initiating cost estimates for development or procurement.	873	PM	determine	RF spectrum supportability	IAW OMB Circular A-11	
	All DoD components shall obtain spectrum utilization guidance from the Military Communications-Electronics Board (MCEB) in accordance with DoDD 4650.1 .	874	PM	obtain	RF spectrum guidance	from Military Communications-Electronics Board (MCEB) IAW DODD 4650.1	
	Systems and equipment shall comply with applicable national and international spectrum management policies and regulations.	875	PM	comply	RF spectrum policies and regulations	national and international	
	Requirements for foreign spectrum support shall be forwarded to the MCEB for coordination with host nations where deployment of the system or equipment is planned.	876	PM	forward	RF spectrum requirements	to MCEB for foreign coordination	

Applicable DoD 5000.2R Statements

Extracted Requirements

Section / Statement	No.	Subject	Task	Object	Modifier	Using
4.4.8 Unplanned Stimuli — All munitions/weapons shall be designed to withstand unplanned stimuli and use materials consistent with safety and interoperability requirements.	877	PM	develop	requirements	for unplanned stimuli	
	878	PM	use	materials	consistent with safety requirements	
	879	PM	use	materials	consistent with interoperability requirements	
Requirements shall be determined during the requirements validation process and shall be updated as necessary throughout the acquisition cycle for all acquisition programs.	880	PM	determine	requirements		requirements validation process
Interoperability shall be validated per CJCSI 3170.01 , to include insensitive munition policies.	881	PM	validate	interoperability	IAW CJCSI 3170.01	
	882	PM	validate	Insensitive munition policy adherence	IAW CJCSI 3170.01	
4.4.9 Value Engineering — Value Engineering (VE) shall be applied to projects and programs as required by OMB Circular A-131 .	883	PM	evaluate	design	IAW OMB Circular A-131	Value Engineering
The PM shall consider an incentive approach and/or a mandatory approach as described in the FAR 48 and the DFARS 248 .	884	PM	consider	incentives / mandatory Value Engineering	IAW FAR 48 and DFARS 248	contract

Applicable DoD 5000.2R Statements

4.4.10 Vertical Integration

Where the system design is necessarily restrictive, PMs shall identify and evaluate the potential for vertical integration and its possible effects on the program (see 3.3.2.4).

6.2.1 Acquisition Program Baseline (APB) Reporting

Program Managers (PMs) shall maintain a current estimate of the program actually being executed and shall report the current estimate of each APB parameter periodically, as requested, to the MDA.

Extracted Requirements

No.	Subject	Task	Object	Modifier	Using
885	PM	identify	vertical integration potential	effects on the	
886	PM	evaluate	vertical integration potential		
887	PM	maintain	APB	current with program execution	
888	PM	report	APB	as required	

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